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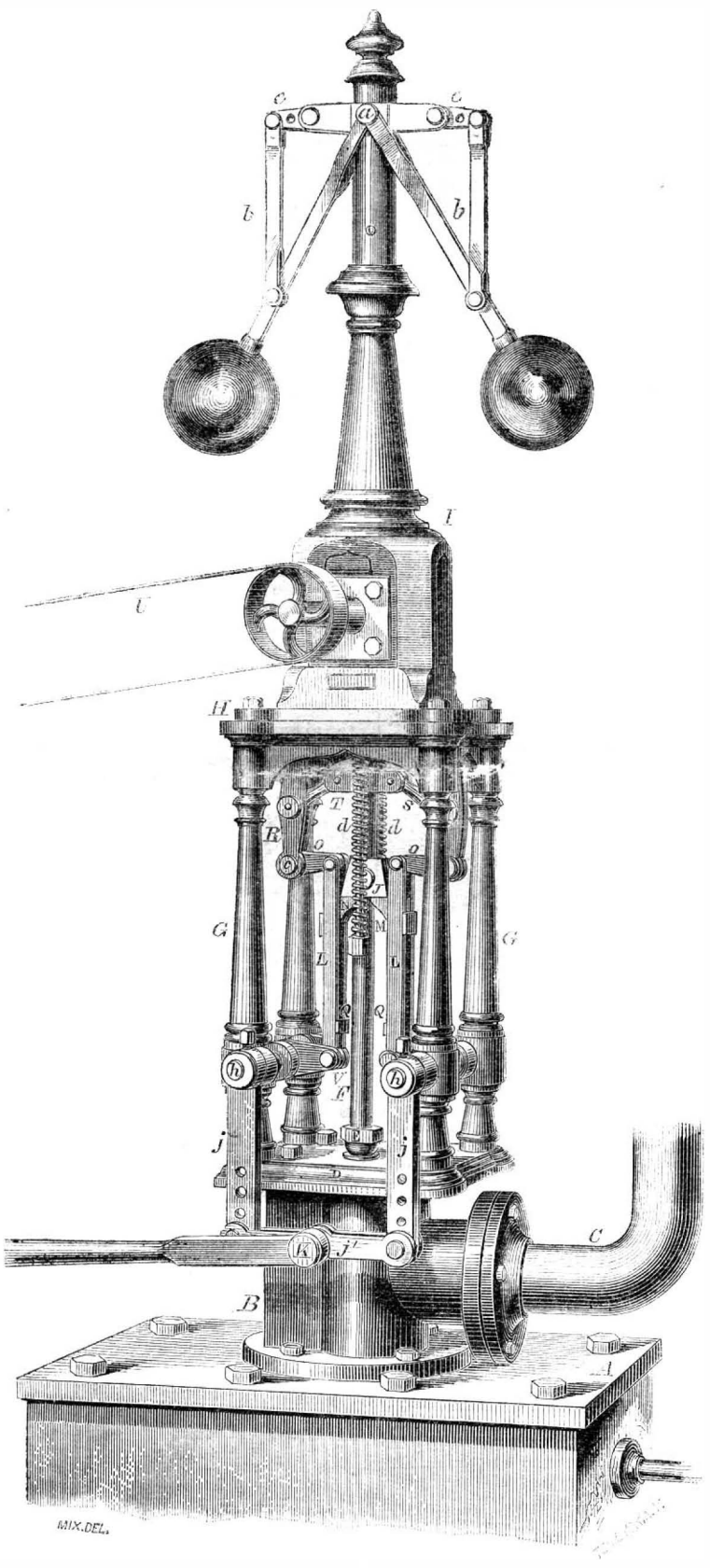
Improved Governor and Cut-Off.

BROUGHTON'S CUT-OFF AND GOVERNOR.



The improvement represented in our engraving is the invention of John Broughton, of New York, and which was patented Dec. 21, 1858. It is designed to regulate the cut-off by the governor, and by a small variation in its motion to produce sufficient effect in the opening or closing of the valve. The movement is perfectly adapted for all situations, and can be arranged either as a variable or automatic cut-off, and to a slide or other valve. Our illustration is a perspective view of the complete device, as arranged to work in connection with the ordinary slide valve.

A is the steam chest, on which is mounted the valve casing B, that is supplied with steam by the induction pipe, C. On the top of B a cover, D, is placed, having in it a stuffing-box, E, through which the valve stem, F, passes. To D are secured four pillars, G, carrying the cap plate, H, and governor case, I. On the valve stem, F, a tappet, J, is secured by a screw, and by this the valve is moved in the manner about to be described.

Steam being admitted to the engine, and the wrist pin, K, being connected with the eccentric, motion will be imparted to the two rock shafts. *h h*, by the link, *j'*, and arms, *j j*, and these will vibrate the two arms, V, in opposite directions, so that one will ascend while the other descends, and will thus cause the rods, L, under the guidance of the links, O, to receive a combined vertical and horizontal motion, the links, O, vibrating on the pins, *c*, which connect them with the rods, R, in a corresponding manner to their respective arms, V. In this motion of the rods, L L, their ascent brings the toes of their lifters, M N, into contact with the tappet, J, and causes the valve to be lifted to admit steam to the steam-chest of the engine, till the toe which is in operation on the tappet is, by its horizontal movement, caused to pass the extremity of the tappet, or in common phrase, to "trip" it, when the valve is instantly closed by its own weight, by the pressure of steam, by the action of springs, *d d*, applied to operate on its stem. The lines described by the arms, V, links, O, and rods, L L, being the same in their return, or descending, as in their ascending motions, the toes of the lifters, M N, are brought into contact with the sides of the tappet, J; but the springs, Q Q, allow them to yield till they have passed the extremities of the tappet, when the springs re-act, and return them to a position to lift the tappets when they ascend again.

The eccentric or driver is intended to be so set that the stroke of the arms, V, and links, O, will terminate as the crank of the engine is at half stroke; and by varying the position of the centers of motion, *c*, of the links, O, in planes corresponding or parallel with the planes of movement of the links and the arms, V, the valves may be made to trip at any point in the stroke of the engine from the commencement to half stroke, or may even be prevented tripping altogether, if it should be desirable, at any time, to run the engine under a full head of steam. It is to effect such variation of position of the centers, *c c*, that the points of suspension are arranged in pendulous rods, R.

When the rods, R, occupy such a position that the horizontal movement of the rods, L L, and lifters, M N, permits the escape of the lifters from the tappet at the precise moment that their upward movement terminates, the steam is cut off at half-stroke; but if the rods, R, occupy a position which brings the points, *c*, closer to the valve stem, the lifters will not escape at all, but after lifting the valve stem, will gradually lower and close it; or if the rods occupy positions which bring the points, *c*, further from the valve stem, the lifters will escape, and permit the tripping of the valve before their vertical movement terminates, and thus cut off the steam at a point earlier than half-stroke. The rods, R, are adjusted to vary the cut-off, by sliding the slide, T, up or down the valve stem, which movement causes the links, S, to act as a toggle upon the pendulous rods, R, and thus draw them toward or force them from each other. The slide, T, may be adjusted by hand gear to effect the cutting-off permanently at such point in the first half-stroke of the engine as may be desired, and to vary such point as may be desired; but I have represented it as connected with a governor, for the purpose of employing the cut-off as a regulator of the speed of the engine, the connection being such that any increase of speed of the engine will cause the rods, R, to carry the centers of motion, *c*, away from the valve stem, to make the valves trip earlier in the stroke, and *vice versa*.

The peculiar advantages which characterize this cut-off gear are as follows:—First, By means of the combined vertical and horizontal action of the lifting rods, L L, and lifters, M N, the lifters are caused alternately to connect and disconnect with the valves, by their own inherent and continuous motion, without the use of stops, cams, or other appendages commonly employed to effect their tripping or disengagement.

Second, Owing to the rods, L L, remaining, throughout the whole lifting movement, parallel, or at the same angle with the rod or stem, F, the lines of the surfaces of contact of the lifters and tappet are always in the same direction, and coincide with each other, thus rendering them but little liable to wear.

Third, As a governor attachment, it renders the governor capable of exerting great power to effect the variation of the cut-off, while the power required to effect such variation is comparatively insignificant; hence it allows the governor to retain the sensitiveness due to an almost unimpeded action.

The governor changes the position of the center of motion, *c*, and so effects the proper variation in the period of the cut-off, through the medium of the slide, T, links, S, and suspended rods, R. The governor is also a novelty, being a device for producing a useful effect from a small motion in the balls in that kind of governor in which an upward motion of the balls produces a downward motion of the central rod. Hitherto the arms have been suspended at some distance from the center, and the apex of the cone formed by them while rotating, has, as the balls rose or fell, been continually changing, consequently a variation in the length of the pendulum takes place at both ends. The arms of this governor are suspended at the center, thus confining all change to the lower end of the pendulum. Links, *b*, are connected to the arms, and levers, *d*, that depress the central rod, thus making this simple and reliable governor extremely sensitive and accurate in its operation. The governor receives motion by the belt in the ordinary manner.

A patent is pending on this device. Every mechanician will at once be able to see the utility of this arrangement, as a contribution to the economical working of the steam engine; and to those who feel interested in it, the inventor will be happy to give any further information upon being addressed at Room 31, New York and New Haven R. R. Depot, Franklin st., New York, or to Thomas Bennett, agent, corner of Elm and Franklin sts., New York.

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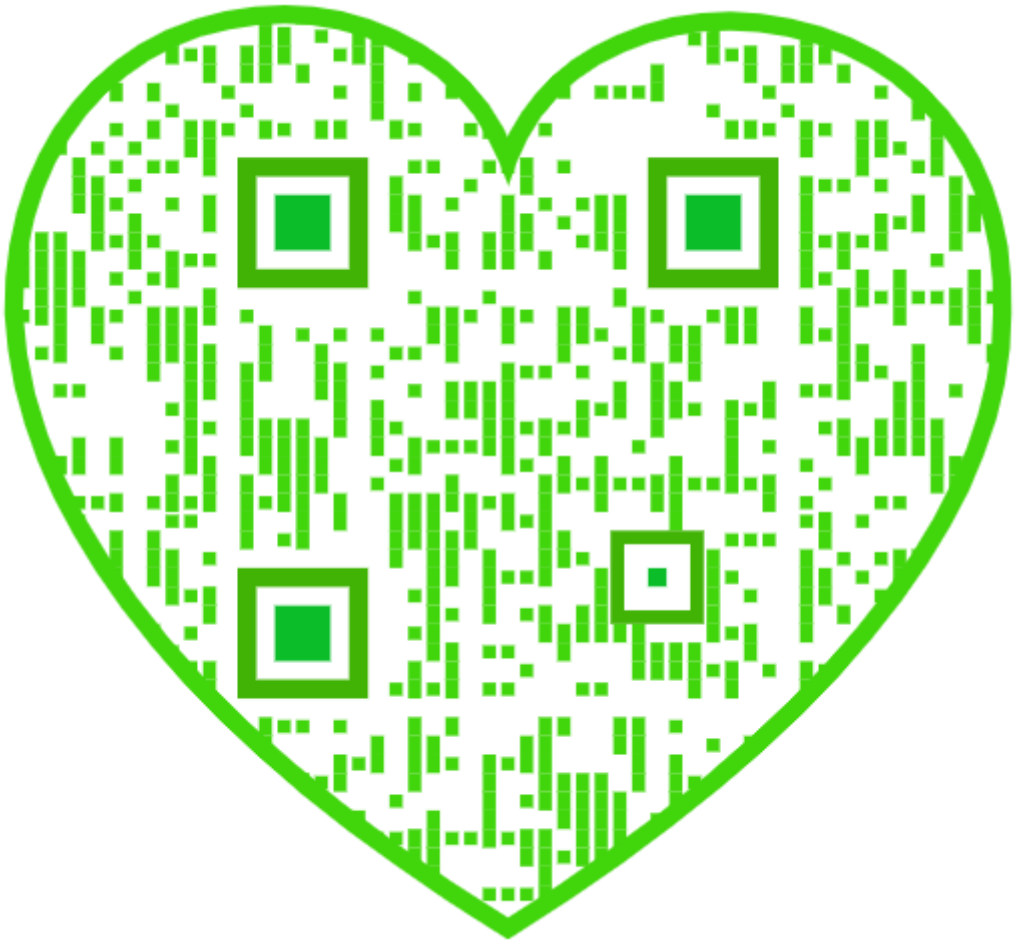

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*** Circulars giving full particulars of the mode of applying for patents, size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

APPARATUS FOR RAISING AND FORCING FLUIDS—Manoah Alden, of Philadelphia, Pa.: I wish it to be distinctly understood that I lay no claim to the parts described, separately, or disconnected from each other.

But I claim the wheel, B, with any convenient number of buckets formed by the opposite curved vanes, e, said vanes being placed obliquely to the plane of rotation, and being of a tapering form, so that the buckets may be broader near the center of the wheel than at the edge of the same, in combination with a wheel race or chamber adapted to the form of the buckets, and with the spiral channel, D, the whole of the parts being arranged in respect to each other, and constructed as and for the purpose set forth.

BURNERS FOR VAPOR LAMPS—Charles F. Allen, of Indianopolis, Ind.: I claim the combination and arrangement of the tube, F, and lighter, G, when constructed and arranged substantially as and for the purposes set forth.

COTTON PRESS—Zachariah Atkinson, of Richmond, Ga.; I claim the cam rollers, F, in combination with the levers, D and E, substantially as set forth, for the purposes described.

GAS COUPLINGS—J. B. Atwater, of Berlin, Wis.: I do not claim the employment of any of the parts of this coupler to be new, uncombined, and differently arranged, as I am aware that the pin has been thrown down in other couplers by means of the link pressing against such parts as affect it; hence I disclaim all other modes of effecting the result attained, confining myself to the arrangement specified.

I claim the arrangement of the tumbler, c, rod, C, connecting piece, D, lever, E, which is provided with a foot piece, o, pin, d, rollers, m n, and door or platform, i, the whole being combined and operated in the manner and for the purpose specified.

PUMPS—Charles F. Bellows, of Seneca Falls, N. Y.: I claim the arrangement and construction of a pump, as set forth, by means of right-handed and left-handed screws, the threads of one operating within those of the other, as described, or other mode substantially the same.

OVENS—D. P. Burdon, of Brooklyn, N. Y.: I claim, first, The arrangement of a series of hinged cars, a, around a disk plate, d, so that they will deliver bread pans with their contained bread at the proper place of discharge, and also receive the said pans in their revolution, substantially in the manner set forth; and in combination therewith I claim the circular track, A A', so arranged as to support the ends of said cars, as upon friction rollers, n, while at the same time allowing each car, a, to deposit its pan at the proper place, and restore said cars, a, to their proper position to receive the return pans with their bread, in the manner and for the purposes set forth.

Second, I claim operating the sliding doors, E B, by means of the radial arms, b, or their equivalents, projecting from the driving shaft, g, so that the doors, E B, will be alternately opened and closed at the proper time for delivering the bread, and receiving the bread to be baked.

Third, I claim operating the traversing follower, r r', by means of radial arms, c, or their equivalents, for feeding the pans into the oven, when the same is so arranged that the pans will be fed into the cars, a, while the door, B, is open; and in combination therewith I claim the compensating pulley wheel, w, and weight, y, for equalizing the motion, and returning the traversing follower, r r'.

FLUXES FOR PUDDLING IRON—John Burnish, James Talbot, and Thomas W. Yardley, of Pottsville, Pa.: We do not claim the separate use as a flux of the substances mentioned, or a compound of any two or three of the said substances.

But we claim silicious sand, loam, alum, clay, lime, oxyd of iron, and talcose rocks, when used collectively in, or nearly in the proportions described, as a flux in the process of puddling iron.

WASHING MACHINE—Zjiba Casterline, of Liberty, Ind.: I claim the employment of balls, h h h, attached to the rubber, E, of a washing machine, when said rubber has a reciprocating movement in the tub, constructed and operating in the manner and for the purpose set forth.

MACHINE FOR POLISHING METALS—Reuben Cave, of Louisville, Ky.: I do not claim the running of two polishing grit stones together, or running them both at the same time.

But I claim the running of two polishing grit' stones edge to edge, in opposite directions, one immediately above the other, and both running at the same time, the upper stone running one-third faster than the under one

RAILROAD CAR SEATS—Willis L. Childs, of Piermont, N. Y.: I do not claim, broadly, a reversible car seat.

Neither do I claim, irrespective of arrangement and construction, a car seat capable of being converted from an ordinary day seat into a sleeping couch at night, and vice versa.

Neither do I claim suspending a seat upon the point, a, irrespective of arrangement and construction, for many plans have been devised for effecting such purpose.

But I claim attaching to each end of the planes or boards, A and B, a curved or segment bar, lapping by each other, so that they will form an arc, having for its center the point at which the planes or boards, A and B, are hinged or jointed.

I also claim suspending a car seat upon the point, a, in combination with the hinging of the planes or boards, A and B, substantially as shown, so as to enable it to be reversed without concussion, and also to be used as a reclining seat or sleeping couch.

[This is an improvement in that class of car seats which can be used as seats by day or berths by night. It is very simple, easily changed from one to the other, and in both positions is remarkably comfortable.]

WATER WHEEL—William Coutie, of Troy, N. Y.: I claim the stationary plates arranged as described, so as to prevent a rotary motion in the water when acting on a screw wheel.

I also claim placing the gate below the surface of the back water, in connection with the draft tube, for the purpose specified.

STOVES—Porter Dodge, of Francistown, N. H.: I claim an improved air-tight stove, the several parts being constructed and arranged in relation to each other substantially as shown and described.

METHOD OF VARIEGATING WOOD—Joseph Cowee, Jr., of Keene, N. H.: I do not claim, broadly, the condensation of the fibers of the wood for purposes of ornamentation.

But I claim the employment of rollers, B B, in the manner substantially as described, for the purposes of variegating wood, all as set forth.

[A description of this invention will be found on an other page.]

SPLICE OF BAR RAILS—Wm. M. C. Cushman, of Albany, N. Y.: Having described the flanch fillet or rib, b, outside of the flat bar rails, and up to, and even with, the top or bearing surface thereof, it is hereby expressly understood that I do not claim it even therewith, for the purpose of receiving the tread of car wheels, or any part thereof, of ny train of cars passing over the rails of any railroad, or for any other purpose than specially to add strength to the splice plate, and to prevent lateral displacement of the flat bar rails aforesaid, by means of the said splice plate.

But I claim in combination with the flat bar rail, the splice plate or piece constructed in the manner and for the purposes described.

HARVESTERS—Charles G. Dickinson, of Poughkeepsie, N. Y.: I do not claim the slots, neither the endless chain or belts.

What I claim is, the combination of the curved arms, O, curved feet, E, and braces or compressors, F, with endless belts or chains, B, when arranged with relation to each other and to the platform, A, and operating together in the manner described for the purpose specified.

ENVELOPE MACHINE—James B. Duff and Thomas W. Keating, of New York City: We do not claim, broadly, the invention of oscillating lappers to fold envelopes. Nor do we claim the arrangement and combination of a half circle with the heels or base of the lappers.

But we distinctly disclaim the folding flaps projecting from the center, or nearly so, from the end of a shaft or shafts, and having their bearings on one end or on each end thereof, whether with or without the half circles, as set forth in the third claim of Milton G. Putters' patent, November 23, 1858, and we hereby disclaim all and every part covered by said Puffers' invention.

First, We claim the combination of the pasters, a a, the grooved pressure fingers, S S, and the spring plates K' K', the whole being applied to operate substantially as set forth.

Second, In combination with a feeding table, having its surface composed of india rubber, or other elastic substance, we claim the use of a plunger operating through a die above the said table, and provided with sharp projecting edges for the purpose, after it has forced the blank through the die, and thus turned back the flaps, of making a sharp crease where the fold is to be made, by pressure between said edges and the elastic surface.

Third, We claim placing the faces of the lappers, I' I2 I3 I4, in front of their centers of motion, and their axes above the level of the table, as shown and described, so that the plunger, E, when it descends, shall pass close against the faces of the lappers, and the heels of the lappers, when the latter close, will move outward away from the paper, as shown and described.

Fourth, We claim having an open space between the heel of the lappers, I1 I2 I3 I4, to receive and hold the edges of the paper, when it is pressed therein by the descent of the plunger, as and for the purposes shown and described.

[For more information about this invention see another page.]

APPARATUS TO MANUFACTURE STARCH—Wright Duryea, of Glen Cove, N. Y.: I do not claim to have invented the process of obtaining the starch water by frequent repetitions of the grinding, washing, and bolting processes.

But I claim, first, The described system of arranging and combining the grinding, washing, and bolting apparatus, to wit, the arrangement of all the stoves side by side, with their respective washers conveniently placed below them, with the arrangement of the bolting cylinders below their respective stones in horizontal series, with one or more interposed endless chain elevators, P, combining them with the stones next in order of succession in the series, as set forth, whereby the whole apparatus is brought within two stories of a building, and convenience is afforded for its supervision, and the other advantages set forth are obtained.

Second, The combined arrangement of the lower bolting cylinders, I I, and inclined plane or table, O, with the troughs or gutters, m and t, substantially as described, whereby I am enabled to convey away the starch water and the tailings from the said cylinders, by a single conductor for each purpose.

[This invention relates to the process of obtaining the starch water from which the starch is subsequently extracted, by grinding the grain between stones, then washing with water, and passing the ground grain and water through bolting cylinders, re-grinding the tailings from the cylinders, re-washing, and re-bolting, repeating the re-grinding of the tailings, and the re-washing and re-bolting of the products till nothing of the grain remains but the bran. In performing this process heretofore, it has been common to employ a series of stones arranged one below another on separate floors of a building, with the bolting apparatus interposed between them, and to commence the process at the top of the building, and continue it all the way down to the bottom, which has required very lofty buildings, and has rendered the apparatus very difficult of supervision. This invention consists in a certain system of arranging the grinding and bolting apparatus, and of combining the same by means of elevating and conducting apparatus, whereby the whole is brought within two stories of a building, the grinding and washing apparatus all on the upper, and the bolting apparatus all on the lower story, so that besides bringing the apparatus together in such form as to be easily supervised or tended, it can be driven by a simpler system of shafting, gearing, and belting, than when arranged in so many stories. The invention further consists in the employment, in combination with a series of bolting cylinders arranged side by side, of a flat surface of sufficient extent to receive the starch water from the whole series, by which means a freer circulation of air is obtained through and between the cylinders than when separate concave troughs are employed under each one, thereby preventing the so rapid clogging of the bolting cloths, and obviating the necessity of the so frequent removal and washing out of the said cloths.]

MACHINE FOR TURNING OR EDGING BRICKS—Charles O. Farrington, of Brewer, Me.: I claim the slats, E, attached by joint hinges, a, to the bars, A A, and connected by joint, c, to the bar, F, which has the spring, G, attached to it, the whole being arranged substantially as and for the purpose set forth.

[A series of slats are attached by joints or hinges to a suitable frame, and connected by a spring, so that unburnt bricks, when drying, may be turned over from a flat position as they are left by the molds, to a position edgewise, with greater rapidity, and far greater facility than they can be turned by the usual hand process.

ESCAPEMENT FOR TIMEKEEPERS—Charles Fasoldt, of Rome, N. Y.: I claim the employment of a straight lever and collateral hook in the position and form indicated and described.

MACHINE FOR MANUFACTURING WOODEN TROUGHS—Samuel T. Field, of Worcester, Mass.: I claim arranging the bearings of the saw and the mechanism by which it is driven, substantially as described, whereby the upper surface, and also the interior of the saw, is left unobstructed, for the purpose set forth.

I also claim, in combination with a cylindrical saw, a secondary cutter, arranged substantially as described, so as to groove the core of the stick while it is being sawed out by the cylindrical saw.

CRACKER MACHINE—Joseph FOX, of Lansingburg, N. Y.: I claim, first, The depressions in the spaces between the grooves in one or both of the rollers that form the strips of dough from the sheet, as described, for the purpose specified.

Second, I also claim forming short sections of skin covered strips of dough into disks, or crackers, by pressure applied to ends of the sections, by the devices substantially as described.

Third, I claim the rollers substantially as described, by which the crackers are rolled on the apron, and by which the skin on the upper surface of the pressed crackers is improved.

Fourth, I also claim the combination of the straight edges for evening the rows of crackers before rolling, and also for docking, as specified, with the dockers, substantially as set forth.

Fifth, I also claim the employment of the clamp bars, I I', in combination with the knife, H, as described, to cut off and hold the sections of the strips of dough, as the strips are fed through the bar, G, as specified.

Sixth, I claim the plane, T, follower, U, and second endless apron, S, substantially as combined and arranged among themselves, and with the other endless apron, for the purpose of taking rows of crackers from a moving endless apron, and placing them upon the bake-pans.

SLIDE VALVES FOR STEAM ENGINES—James Freeland and R. H, Lecky, of Allegheny, Pa.: We claim, first, The arrangement of the armed flange, M, on the steam pipe, L, the columns, R, the studs, O, with nuts, P, and the cap, K, the whole being arranged and secured to the valve seat, A, as described and represented.

Second, The arrangement of chamber, G, with opening, H, as described and represented, and for the purpose set forth.

Third, The combination and arrangement of the armed flange, M, on the steam pipe, L, columns, R, studs, O, with nuts, P, stuffing-box, N, cap, K, and slide valve, B, with the valve seat, A, the whole being arranged, combined and operated as described and for the purpose set forth.

HANDLES FOR TABLE CUTLERY—J. W. Gardner, of Shelburne Falls, Mass.: I claim, as an improved article of manufacture, a table knife having its handle composed of two or more parts, a b, the ends of which are encompassed by ferules, d, and otherwise constructed as shown and described.

[The object of this invention is to render available for the construction of handles of table cutlery small pieces of stock, which being incapable of being worked up, have been sold by the cutlers at a very low price to the manufacturers of smaller articles. Ivory and horn are the materials chiefly used for the purpose mentioned, and these articles have of late increased so materially in price that the cost of table cutlery has been greatly enhanced, and various compositions have been substituted for ivory and horn.]

SPERMATIC RINGS—Dwight Gibbons, of Rochester, N. Y.: I claim the employment in a ring encircling the penis of a sharp pin or point attached to a spring which is held by a roller, i, or other equivalent rest, so as to prevent the protrusion of the said pin within the interior surface of the ring till distension of the penis occurs, and by its action on the spring causes its liberation from the roller or rest, and thereby permits the said spring to force the pin or point into the penis, substantially as described, with a sudden action, instead of with the gradual action peculiar to the points of other rings for the same purpose.

Second, The combination of the two semi-circular or nearly semi-circular springs, with the two rigid sockets, substantially as described by means of a slot and set screw in one of the sockets, which permits the ring of the instrument to be adjusted to organs of various sizes.

[This invention is explained in the claim.]

RAILWAY CHAIRS—J. W. Gould, of Elmira, N. Y.: I claim the self-securing "lock wedge," C, arranged in combination with the rails, A A, chair seat, B, and key, D, substantially in the manner and for the purpose specified.

RETORTS FOR DISTILLING COAL OIL.—N. B. Hatch, of Lawrenceville, Pa.: I claim the application and use in retorts used in distillation of coal or other substances, from which oil or gas is producable, of a sweep bar or arm, with plates attached, substantially as described, and operated so as to push or spread the material placed within over the floor or bottom, and at intervals discharge the same continuously in openings at or near the edge of the retort, substantially as set forth in the specification and drawings.

SCRUBBING PAIL—A. P. Hawse and L. J. Adams, of Morrisville, Vt.: We claim the combination of pail, P, rollers, R R', and pieces, a a', and C, arranged and operating substantially as and for the purposes set forth.

SHIRT COLLARS—G. W. Beard, of Boston, Mass.: I claim as an improvement in the "turn down collar," the construction of the same with four cravat slots or passages, a b c d, arranged therein, or with respect to the ends of the inner fold of the collar, and for the purpose of receiving a cravat or tie ribbon, substantially as specified.

I also claim the described mode of applying or arranging a cravat or neck tie in the collar, constructed with the four slots, or passage, a b c d, arranged within it or with respect to the ends of its inner fold essentially as explained.

WASHING MACHINE—John Hebden, of Medford, Mass.; I claim the machine constructed substantially in manner and to operate as described, that is to say, with a removable dasher, or its equivalent, and a removable platform combined and arranged with the suds reservoir and mangle rollers, essentially as set forth; the whole not only enabling the operations of washing the clothes, expressing the water from them and mangling them to be carried on consecutively, but causing clothes to be drawn out of the suds reservoir and the express water to be received into it, as specified.

MILL FOR GRINDING CANE, &C.—Isaac A. Hedges, of Cincinnati, O.: I claim, first, Surrounding the openings in the top and bottom plates with annular ledges, L, when employed in connection with rollers having recesses corresponding with them in their top and bottom ends, substantially as described.

Second, I claim the regulator and adjuster, substantially as and for the purposes described.

Third, I claim the oil tubes, H, when used in connection with a recess containing waste oil to conduct the same through the rollers to the bearings below.

Fourth, I claim the corrugated shells in combination with the rollers for the purpose of readily converting the mill into a corrugated mill, constructed and adapted substantially as set forth.

CLOTHES' FRAME—Dexter Henshaw, of Fitchburg, Mass.: I claim the combination of the four arms and the block with the cords, screws and braces, as described and for the purposes aforesaid.

MACHINE FOR GRINDING AND POLISHING SAWS.—J. A. Hendricks, of Providence, Pa.: I do not claim, seperately, any of the parts shown and described.

But I claim the grindstone or emery wheel, B, in combination with the feed rollers, D D, placed in the adjustable frame, C, the whole being arranged to operate substantially as and for the purpose set forth.

[A grindstone or polishing wheel is employed in this invention in connection with feed rollers placed in an adjustable frame, and arranged relatively with the stone or wheel, whereby a very efficient, simple and economical device is obtained applicable for grinding edge tools and cutlery of various kinds having either plane or concave sides.]

ROTARY HARROWS—W. T. Hildrup, of Harrisburgh, Pa.: I claim giving the sleeves, B B', an invariable connection, at one extremity, and a variable connection attached to the draft bar at the other, substantially as and for the purpose set forth.

MACHINE FOR MAKING MEAL AND FLOUR—G. W. Holman, of Beloit, Wis.: I do not claim adjustable knives for the purpose of grinding grain, or screws for feeding grain to grinding surfaces in mills, or cone pulleys, or tangent screws, or emery wheels for sharpening knives.

But I claim placing a series of knives supported by gudgeons in a circle, or part of a circle, so that the thickness of the shaving cut by the edge of one knife shall be gaged by the back of the knife next to it, as and for the purpose specified.

And I also claim the placing a series of knives, supported by gudgeons, so that the rankness of set of all of them, may be uniformly graduated by one operation, and so that their faces may be throwu back into one uniform surface for grinding or sharpening, as set forth.

I also claim the band, f, at the end of the knives, constructed and operating substantially as described.

I also claim the arrangement of the reversed screw threads on the arbor, n, and the reversed screw threads on the core, for the purpose of moving grain in opposite directions at the same time, as combined with the other parts of my machine, substantially as set forth.

MILL FOR GRINDING GRAIN—Wm. H. Hope, of Washington, D. C.: I claim the combination of a cylindrical corn and cob-cutter and crusher for grinding food for cattle, with two sets of grinding surfaces, arranged and operating substantially as and for the purposes set forth.

Second, I claim the arrangement by which the cylindrical rollers or cutters and crushers and grinding surfaces may be operated together or separately, as and for the purposes set forth and described.

Third, The mode of regulating the cylinders and stone for the purpose of grinding coarse or fine by the use of the screw lever, l, attached to the journal boxes, e, which move on ears or lugs firmly attached to frame, F, in the manner described and specified.

APPARATUS FOR REGULATING THE DRAFT OF ENGINES—W. S. Hudson, of Paterson, N. J.: I claim, first, The interposition of a perforated diaphragm E, constructed substantially as described between the steam and exhaust pipes, and extending down to or near the level of the lower tubes, substantially as and for the purposes shown and described.

Second, Making the apertures above the base of the diaphragm, E, of such area that when the locomotive is standing still, the gaseous products of combustion may flow through without serious obstruction, but that when the combustion is increased by the blast, a large portion is compelled to pass underneath, substantially as set forth.

OVENS—Geo. C. Jennison, of Ware, Mass.: I do not claim an endless carrier, in combination with and arranged in a baking chamber separated from a furnace or chamber of combustion by a partition wall, or equivalent, through which the heat from the furnace has to pass in order to obtain access to the baking chamber.

But I claim the application of the baking chamber of the endless carrier to the furnace in such manner that the air within the said baking chamber may come into direct contact with the furnace charge or heated volatile products arising therefrom, and be heated thereby, without the heat having first to pass through any dividing wall, or partition, or its equivalent.

I also claim the arrangement of the baking chamber with respect to the furnace and its discharge flues, substantially as described and as represented in the drawings, whereby the advantage of the ascending power of the heat is availed of, while the smoke is carried off by the flues.

I also claim the arrangement of the charging and discharging orifices of the baking chamber, with reference to it and the lower smoke eduction passage leading into the discharge flue of the oven.

I also claim the arrangement and application of the pendulous platforms, and the endless carrier, together and within the vertical baking shaft.

I also claim the combination and arrangement of one or more openings i i, and their dampers, with the baking chamber and its furnace and flues, arranged as specified.

WEIGHING SCALES—O. W. Jipson, of Rochester, N. Y.: I do not claim, separately, any of the parts shown and described.

But I claim, first, The sliding block, H, when provided with the rollers, k l, and slide or supplemental weight, I, arranged and combined as shown for the purpose specified, and with or without the rack, j, and pinion, m.

Second, The adjustable block, J, provided with the slide or weight, s, graduated bar, r, in combination with the nut or supplementary weight, q, as and for the purpose set forth.

Third, The attachment of the lever, C, to the platform frame, whereby the same may be adjusted farther in or out from the frame as circumstances may require.

Fourth, The arrangement of the bars, L L L L K K, with their sockets, v v. b b', and with the frame, B, substantially as shown, to admit of the adjustment of the bars to receive platforms of greater or less size, as required.

Fifth, The employment or use of the sleeve, E, attached or applied to the beam, C, as and for the purpose specified.

[This is an improvement in weighing scales which insures greater accuracy, and the weights moved with great facility, and all the parts are adjustable to compensate for any want of adjustment in any other part.]

FLOATING AND REVOLVING DERRICK—E. Jones, of Brooklyn, N. Y.: I claim the arrangement of the turn table, or frame, which carries the derrick, when placed on the bottom of the scow, or below the deck, substantially as described,

I also claim supporting the upper turn table or frame of the derrick by means of a circle and wheels, substantially as described.

HORSESHOE MACHINE—Wm. W. Lewis, of Cincinnati, O.: I claim, first, The combination in a pair of rolls of of a groove, b b b', and creasers, a, which will, by their joint operation, exert pressure in a lateral as well as a longitudinal direction, substantially as and for the purposes set forth.

Second, In combination with the above, I claim dividing the rollers radially and vertically, substantially as and for the purposes described.

[This invention consists in a certain construction of a pair of rollers, which may be used both to feed a bar of iron to a bending apparatus of any other description, and to form it with one side beveled in such a manner and with the creases on the opposite side, that the bending operation is all that is necessary to complete the shoe with concave and creases, or which may

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be used as a separate machine to roll a bar of iron into a series of lengths which only require to be cut apart, and subjected to a proper bending operation, either in a separate machine or by hand, to be made into complete shoes.]

TOOL FOR CROZING AND CHAMPERING BARRELS—H. Martin, of Louisville, Ky.: I claim the stock, A, provided with the rollers, C C, arranged so as to be capable of being adjusted longitudinally and laterally in the stock, substantially as and for the purpose set forth.

[A stock or gage constructed in a novel way is arranged to admit of the attachment of either a crozing or chamfer tool, and it is applicable to casks or barrels of any size.]

APPARATUS FOR INCREASING THE DRAUGHT OF FURNACES—J. B. Martin, of Wilmington, N. C.: I claim, first, The combination of a fan, with the exhaust, when arranged within the smoke stack, substantially as described, so that the exhaust steam, as it issues from the exhaust pipe acts directly on the blades of the fan, and then passes with the products of combustion in a direct path through the fan and through the smoke stack, thus causing the fan to turn with high velocity, and thereby accelerating the draft of the furnace, as set forth.

Second, The combination of the deflecting plates with the blades of the fan, for the purpose of intercepting sparks and cinders, as described.

SLEEPING CARS—T. E. McNeill, of Philadelphia, Pa.: I do not claim, broadly, so altering the seats of railroad cars that they may be arranged as longitudinal sleeping couches in four rows with two passages.

But I claim, first, Constructing the seat, C, of the swing seat of a railway car, with guiding strips or their equivalents, and padded leaves, H, and H hinged together and to the seat, so that the latter may be extended and form a comfortable couch for sleeping purposes.

Second, The frame, e', arranged to receive the padded board, e, when the frame is hung to one end, D, of the couch, and the board to the opposite end by rods, f, and when the whole is combined with the swing seat of a railway car, so as to form a rest for the back during the day, and a sleeping couch for the night, as set forth.

COFFEE POTS—C. A. Merchant and G. L. Patterson, of Frankfort, Ky.: We do not claim a reservoir containing cold water, as such is well known, but, we claim the combination and arrangement of the cylinder, H, in the reservoir, B, and the tubes, D, E, and F, C, in the manner, and for the purpose described.

CLOVER PICKERS—Wm. T. Mills, of Galesburgh Mich.: I do not claim any of the members of this machine, individually, as they are not new; but I claim providing the teeth, F, F, with the holes, i, i, i, and and angular plate, H, when arranged at the front edge of the adjustable platform or box, A, and in relation to each other, in the manner described, and for the purpose specified.

DISCHARGING WATER FROM FLOATING DRY-DOCKS FOR CANALS—Stephen F. Palmer, of New York, N. Y.: I claim the manner of discharging the water from a floating dock, by means of the underground trunk in combination with the flexible apparatus, to convey the water from the dock without interfering with its rise and fall. Not confining myself to any particular manner, provided it produces the same result of giving the water a self-acting discharge, substantially, as before described.

VARIABLE EXHAUST PIPE—Wm. P. Parrott and Stephen H. Head, of Boston, Mass.: We claim the described contracting orifice for blast pipes, constructed and operating in the manner and for the purpose, substantially, as set forth.

VARIABLE EXHAUST PIPE—Jones Patrick, of Chicago, Ill.: I claim in combination with a revolving cylinder or plate of variable-sized exhaust openings, the rock shaft, pawl radius bar, their several connections, substantially, in the manner and for the purposes set forth.

SASH SUPPORTER—John F. Peabody, of Salem, Mass.: I do not claim the invention of a rack and a catch; nor the arrangement of a rack, or its equivalent, in the grooved jamb of the window-frame, so as to be covered by the sash while being raised; whether such rack be placed on the bottom of the groove and against the edges of the sash, or against the rear side of the groove and against the rear or outer side of the sash.

But I claim my improved application or arrangement of the rack bar, D, with reference not only to the groove, a, of the window frame, but to the inner side of the sash, B, and to the catch applied thereto, as described, the rack-bar, under such arrangement, not only being in full view with the catch, at any altitude in which the window sash may be placed in the frame, but operating not only to support the sash at such altitude, but to maintain it within the groove, a, as specified.

PHOTOGRAPHIC PLATE VISE—Sylvester W. Pearsall and Washington L. Pearsall, of New York City: We claim the spring rocking jaw and lever, f, in combination with the movable jaw, e, substantially as described and shown.

We also claim the jaw pieces or facings of hard rubber or gutta percha, for the purposes and as specified.

And we claim the arrangement of the rod, d, stock, c, and gudgeon, b, entering the socket, a, and having the set screw, k, by which the apparatus is retained in position horizontally, as specified.

COTTON BALE HOOPS—G. W. Penniston, of North Vernon, Ind.: I claim the tye, A, or friction key, constructed as described, with convex inner bearings, 1 and 2, Fig. 3, when constructed and operated in the manner and for the purposes specified.

HARVESTERS—Sylvester Persons and Alfred W. Cone, of Panama, N. Y.: First, We claim arranging and operating the chain cutters upon an adjustable and vibrating cutter frame, in the manner and for the purposes substantially as described.

Second, We claim the arrangement of two or more rollers, J J, relatively to the chain cutters, multiplying wheel, c, and adjustable vibrating cutter frame, so that the rollers will form a bearing for the chain cutters, and support and hold the chain in gear with the multiplying wheel, whatever may be the position of the adjustable vibrating cutter frame in passing over unlevel surfaces, substantially as set forth.

FANNING MILLS—J. E. Rice, of Oneida, N. Y.: I do not claim, broadly, operating the shoe, B, by a crank.

But I claim the arrangement and combination of the suction chamber, D, spouts, E j, plate, F, and shoe, B, substantially as and for the purpose shown and described.

[This invention consists, first, in a novel means employed for operating or giving the shake motion to the shoe, whereby the grain is more effectually riddled than usual; and secondly, in a peculiar arrangement of the fan box with a discharge screen, whereby the grain, as it passes through the machine, is not only subjected to two blasts from one and the same fan, but the last blast to which the grain is subjected is rendered capable of being tempered or graduated in strength, so as to entirely separate the light from the heavy grain, or as closely as may be desired.]

FILTERING APPARATUS—Nathan F. Rice, of New Orleans, La.: I claim, first, Passing the water through the filtering medium from below upwards, in the manner specified.

Second, I claim the concavo-convex perforated false bottom or diaphragm, constructed and arranged substantially as described.

Third, I claim the air tube, K, leading from the lower chamber, F, as and for the purpose specified.

FIRE AND VENTILATING APPARATUS FOR SHIPS—John W. Richards, of New York City: I claim, first, Arranging and applying the pipes, F F' J, or their equivalents, leading to the different parts of the vessel, in combination with suitable connections with a boiler and a blower, or air-forcing apparatus, that the said pipes may be used as required, to supply either air for ventilation or steam for the extinction of fire, substantially as described.

Second, Applying the several lengths of pipe in a train so that they are capable of being turned in their joint boxes or supports, for the purpose of giving such direction to the ventilating air supplied by each length, as the occupants of the berth or part of the vessel supplied by it may desire, as described.

[A notice of this improvement will be found in another column.

OVENS—Thos. Russell, of New York City: I do not claim to be the first inventor of an oven in which the substance to be baked travels horizontally from a door where it enters to a door on the same side where it is discharged.

But I claim the employment in such an oven, in combination with permanent ways or tracks, arranged at right angles to each other within, without, and through the doorways, substantially as described, and with a series of carriages to run on such ways, of a system of horizontal screws and endless chains, applied substantially as specified, and of teeth, or their equivalents, on said carriages, to connect with said screws and chains, the whole operating substantially as and for the purpose set forth.

And I also claim the opening of the oven doors to admit and permit the exit of the carriages by the direct action of the doors of the carriages themselves, substantially as described, thereby dispensing with special machinery for that purpose.

[A full description of this invention will be found on another page.]

BURR-STONE MILLS—Gelston Sanford, of Poughkeepsie, N. Y.: First, I claim the mode of constructing the casing or shaft with a vertical or upright joint, J, in combination with the lever, G, and edges, R, as a fastener for the shell.

Second, I claim the grinding part, Q Q', and the elevating part, 1, in combination with the cone, B, and shell, B', when constructed and operated in the manner and for the purposes specified.

HINGE—Samuel S. Squire and Theodore Scharfenburg, of Brooklyn, N. Y.: We are aware that hinges have been constructed with a separate pin for each core; and also that centers have been cast on one leaf, and fitted by recesses on the other leaf by means of cores or chills, and we therefore disclaim such devices.

We claim providing the half leaves on one side of a butt with the hinge pins, G G or I, which are solid, with the pattern, and form part thereof when cast in the manner specified.

DRESSING MILL-STONES—Alfred Sheek, of Smith Grove, N. C.: I claim in combination with a plane surfaced land, a, the depression, c, and convex furrow or surface from c to e, the whole forming a new milldress, for the purpose and in the manner described.

ROTARY STEAM ENGINE—H. B. Thomas, of Portage City, Wis.: I do not claim the arrangement of the revolving piston wheel of a rotary engine or pump excentrically within and in contact with an external cylinder.

But I claim, first, So constructing and combining a piston wheel and sliding pistons with two eccentric cylinders, one outside and the other inside the said wheel, that with a proper arrangement of induction and eduction passages, those parts of the pistons within the rim of the wheel, as well as those without, are rendered effective in the operation of the engine, as described, and it is thereby rendered double-acting, either in its employment as a motor or as a pump, or as a combined motor and pump.

Second, The combined arrangement described of the passages and cavities in the cylinder head, B, ring valve, I, and bonnet, N.

[This invention consists in so constructing and combining a piston wheel and two eccentric cylinders, one outside, the other inside the wheel, that with a proper arrangement of passages, the portions of the radial sliding pistons that are inside of the wheel, as well as the portions that are outside are rendered effective in the operation of the engine, and the engine made double-acting. This improvement is applicable to rotary engines, to be used as motors, or to those used as pumps for raising or forcing water. The reversing valve and gear is also new.]

SEWING MACHINES—William W. Wade, of Longmeadow, Mass.: I claim the application to sewing machines of the ratchet or corrugated wheel and pawl, the pawl being kept in place by a friction cam, or its equivalent, and the motion being communicated to the machine, either by a double crank, as described, or by a single crank, or other appropriate means.

I do not claim a pawl and ratchet operated by a lever moved by a limb of a person using the machine.

MACHINE FOR GRINDING SAWS—George Walker, of Port Jervis, N. Y.: I claim, first, The arrangement and combination of the wheel, I, and bed plate, F, substantially as shown and described, whereby said driving wheel is made to drive the bed plate, and also to compensate for the pressure of the grindstone, as set forth.

Second, I claim the flat-bottomed water recess, c c, in the face of the bed plate, F, as shown.

[This invention consists in supporting saws during the operation of grinding them, upon a horizontal bed arranged below the grindstone, by which means the chattering of the saw, and consequent waviness of its surface are obviated, and the water used in grinding, and what is termed the "cut," viz., the particles of stone worn off in the grinding process, are prevented flying away from the place of grinding, and by that means the grinding process expedited. It also consists in suspending the grindstone above the saw bed in such a manner that as much of the weight of the grindstone and no more than is desirable, may be allowed to bear on the saw, and the grindstone is made to bear heaviest on the thickest parts of the saw, and thus sooner grind it to a uniform thickness than when the saw is applied in the usual manner. It further consists in a certain method of applying the power to drive a rotating saw bed for grinding circular saws, that the driving gear serves to confine the bed to the grindstone, and prevent the bearings of the bed wearing out of plumb.]

SIZING FOR COLORED PAPERS—Charles Williams, of Philadelphia, Pa.: I claim the employment or use, in a sizing for marbled and other colored papers, of the solution of the gum resin lac, in combination with a solution of either soap or beeswax, or both, the said solutions being made and incorporated together in the sizing, substantially in the manner and for the purposes described.

CAST IRON PAVEMENT—Chapman Warner, of New York City: I claim the mode of constructing pavements of iron frames of any size, substantially of the form described and illustrated by the drawings, placed at right angles to each other, each surmounted by a single boss, which constitutes the traveling surface, it being so arched and placed upon the frame, and the frames so connected with each other, that the pressure arising from a weight imposed upon any boss, or upon any part of it, shall not be borne exclusively by one part of the frames, but shall be diffused over it, and over the adjoining frames, the manner of connection at the same time preserving the regularity of the surface, by preventing the elevation or depression of any one boss above or below the surface of the others, the space left by the frames to be filled with any material which the circumstances of each particular case may determine.

MACHINE FOR SHAVING THE HEADS OF SCREW BLANKS—Awrin Wood, of Worcester, Mass.: I claim the wheel with its volute and twisted slot, substantially as described, in combination with the ways, or the equivalent thereof, to present the blanks in order, as described, by means of which combination the blanks are separated one by one, and gradually brought to a horizontal, or nearly horizontal, position, as set forth.

I also claim, in combination with the wheel, having a volute and twisted slot, substantially as described, for receiving the blanks one by one from the separating wheel, as set forth.

And I also claim the combination of the inclined ways, the separating wheel, with its volute and twisted slot, the feeding tube and punch rod, or the equivalent thereof, with the jaws on the mandrel as described, and for the purpose set forth.

And I also claim communicating motion to the separating wheel, by an interposed spring spur or catch, or the equivalent thereof, substantially as described, that the spring connection between the impelling mechanism and the separating wheel, or its equivalent, may yield to any obstruction, and thus prevent injury to the mechanism, as set forth.

STEREOSCOPIC APPARATUS—James Lee (assignor to himself and Milton Finkle,) of New York, N. Y.: I am aware that revolving stereoscopic machines have been in use previous to this time, operated in a variety of ways, one of which is, by an endless band, patented by Alexander Beckers, Apr l 7th, 1857, of the city of New York, but to my knowledge there is none constructed and operated upon the principle here claimed.

I, therefore, claim the fan or segment hinge J, fig. 2, or its equivalent, in combination with the picture-holders, F, F, for the purpose specified.

I claim the controlling band, H, or equivalent, for the use specified.

I claim the elastic band, E, or its equivalent, in combination with the pulley, B, and rollers, C, C, and D, for the purposes specified.

I claim the picture-holder, figs. 4 and 5, as described for the purposes set forth. Finally, I claim the combination as set forth and described, but do not confine myself to the exact proportions, as I may vary the same while I obtain the same end by means essentially the same.

MEAT CLEAVER—Ezra Pollard, of Albany, N. Y. (assignor to himself and Joshua Gray,) of Westfield, Mass.: I do not claim a masticator for pounding meat separately, for that or its equivalent has been used before; neither do I claim the cleaver or axe when taken separately.

But I claim the meat masticator, C, in combination with the cleaver, D, substantially, and for the purposes specified.

FLY TRAP—Reuben Shaler, of Madison, Conn., assignor to George W. Shaler,) of New York, N. Y.: I claim the combination of the stud, E, and cover, g, when arranged in connection with the chambers B and C, as described for the purpose set forth.

HARNESS SADDLE-TREES Sam'l E. Tompkins and John Maclure, (assignors to Sam'l E. Tompkins of Newark, N. J.: We claim the tubular projection, a, on the bow A, of the tree, substantially, as shown, so as to form a case for the bolt, D, and permit the securing of the wooden seat-block to the tree, without injuring the same, or allowing it to work loose, and at the same time securing the check-rein hook, C, to the tree.

This invention consists in a novel way of attaching the seat-block of the saddle to the tree, whereby a wooden seat-block, or one constructed of any soft material may be secured to the tree equally as firm, and without any great liability of working loose, than the ordinary metal seat-block. The object of the invention is to obtain a light and durable saddle-tree, one that may be constructed with greater facility than usual, and admit of being covered so as to form a saddle equally as symmetrical as any constructed according to the usual mode.

MACHINERY FOR CUTTING FILES—Milton D. Whipple, of Charlestown, Mass., assignor to the Whipple File Company: I claim the circular rolling cutter, f, operating in the manner substantiallly a set forth.

Second, I claim holding the face of the blank which is being cut up to a face plate or rest by pressure upon its opposite sides, for the purpose specified.

Third, I claim clamping the blank rigidly, while a cut is being made, and releasing it preparatory to its being fed, as set forth.

Fourth, I claim the wedges, o, operating as set forth for the purpose of clamping the blanks, as described.

Fifth, I claim the sheld, z, against which the blank, q, rests, and which is fed up with the blank in the manner and for the purpose substantially as set forth.

Sixth, I claim the described machine for cutting files, consisting essentially of the combination of the elements above claimed, and operating in the manner substantially as set forth.

RE-ISSUES.

REVOLVING FIREARMS—Josiah Ells, of Pittsburg, Pa. Patented April 25, 1854: I claim, first, The combination of revolving breech and stationary barrel, with a lock as constructed as that trigger used to fire the pistol when drawn back raises the hammer to full cock, and there holds it; the revolving breech being the same time rotated as far as to bring one of the chambers in a direct line with the bore of the barrel, and fastened in that position preparatory to firing the piece, substantially in the manner described.

Second, The peculiar arrangement of the parts of my lock described, whereby, as the trigger is drawn back to raise the hammer, the heel of the hammer on the point against which the mainspring bears, is brought so nearly under the center of motion of the hammer that the force of the mainspring is counterbalanced by the pressure of the trigger on the toe of the hammer, and thus it will stand at full cock or may be fired at once as may be desired.

Third, The use of the tubular extension on the fore part of the rotating breech extending beyond and underneath the breech end of the stationary barrel, through which tubular extension the end of the spindle projects, and into which the spindle fits closely, for the purpose of preventing the fouling of the spindle by the residuum of the smoke infiring.

Fourth, The use of a collar at the end of the tubular extension, for the purpose of forming, in combination with the spindle, a locking connection between the revolving breech and the stationary barrel, which is furnished with a corresponding recess for the reception of the collar, as set forth.

Fifth, Forming that part of the spindle which enters the bore of the rotating breech of smaller diameter at the front extremity than at the end where it locks, but by reducing its diameter suddenly, so as to form a step or shoulder at one or more points within the rotating breech having a bore of correspondingly diminished diameter for the double purpose of sustaining the recoil of the breech in firing, and of aiding to prevent the fouling of the spindle by presenting an obstruction to the passage of the smoke between the spindle and the surface of the bore of the rotating breech.

Sixth. Also connecting and locking the barrel and breech to the lock-plate by means of a bracket and spring extending in front of the lock plate, in the manner described.

VAULT LIGHTS—Thaddeus Hyatt, of New York, N. Y. Patented Sept. 19, 1854. I claim in the continuation of illuminating vault-covers the open frame, with its large aperture or apertures, closed with glass, substantially, as described in combination with the protection grating, substantially, as and for the purpose described.

DEVICES FOR PUTTING UP CAUSTIC ALKALIES—Geo. Thompson, of East Tarentum, Pa. Patented October 18, 1856. I claim the putting up of the caustic alkalies of soda and potassa in small quantities in air-tight wrappings, cases or boxes, in the manner described or its equivalent, for the purpose of introducing into general use for domestic and other purposes, these articles, which owing to their peculiar chemical properties, have not heretofore been susceptible of general use in small quantities.

ADDITIONAL IMPROVEMENTS.

SHINGLE MACHINE—James Crary, of Middleport, Ohio. Re-issued September 28, 1858. Patented November 24, 1857. I claim First, The use of the bridles or guide, d', d'', in combination with wrists, a, of the shaving-knives and the conveying grooves and vertical slots, for the purpose of communicating to the shaving-knives a combined drawing-knife and approximating motion during the process of shaving the shingles, substantially, as described.

Second. The use of the spring check-plate, E, in combination with the moveable gate, D, to permit one only at a time of the shingle bolts to pass to the shaving-knives, and prevent the bolt being drawn back, on the retrocession of the feed-board.

Third. The use of a feed-board composed of elastic bars or fingers, each capable of a slight depression at its extremity, so as to accommodate the surfaces of the feed-board to any unevenness or twist in the shingle bolt.

RECIPROCATING SAWS—Patented January 13, 1857. Carlyle Whipple, of Cleveland, Ohio: I claim the adjustable ways, D, and E, and the friction wheels, H, and I, arranged and operating in the manner and for the purposes specified. I also claim the vibrating beams, B and C, in combination with the ways, D and E, and their dependent parts, constructed and operating in the manner and for the purposes set forth.

DESIGN.

STOVES—Apollos Richmond, of Brooklyn, N. Y.

INVENTIONS EXAMINED at the Patent Office, and advice given as to the patentability of inventions, before the expense of an application is incurred. This service is carefully performed by Editors of this Journal, through their Branch Office at Washington, for the small fee of $5. A sketch and description of the invention only are wanted to enable them to make the examination. Address MUNN & COMPANY,

No. 37 Park-row, New York.

Browning for Gun Barrels.

We have at various times published receipts for browning gun barrels, but new subscribers to every volume so frequently ask for such information that by publishing the following we will save frequent answers—and the space occupied—in our "Notes and Queries" column:—

Take one ounce of aqua fortis (nitric acid), two ounces of blue vitriol (sulphate of copper), one ounce of copperas, and one pint of warm water. Mix these together by first dissolving the blue vitriol and the copperas in the water, then adding the aqua fortis. The gun barrel to be browned, after being cleaned from grease with soap and water, is rubbed over with the above mixture, a sponge or rag being used for the application. The gun barrel is now laid aside in a dry place till next day, during which time a coat of rust will form upon it. It is now rubbed with a stiff hair or wire brush, and a second application made as before, and again a third. It is now washed with water in which a little pearl ash or soda has been dissolved, for the purpose of neutralizing the free acid. When dried it is rubbed over with a preparation of beeswax dissolved in turpentine, and rubbed down with a stiff brush. It is usual also, to finish with a varnish made by dissolving 1 ounce of shellac and a very little "dragon's blood" in a pint of alcohol. This varnish is also used for the stocks of guns and makes a reddish brown stain.

WINTER SPORTS ON THE HUDSON. The smoothness of the ice between Albany and Newburg, on the Hudson river, has brought out several ice boats, which get over the ice at the rate of nearly thirty miles an hour. One of these boats, says the *Knickerbocker*, left Albany for Hudson a few mornings ago, and went the first seven miles in thirteen minutes.

The decision of the Commissioner of Patents in the McCormick's extension case had not reached us at the time of going to press. We hope to get it in time for our next issue.

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New Inventions.

Ventilating and Extinguishing Fires in Ships.

The want of fresh air in the berths and the general bad ventilation on board ships, is a great cause of disease and aggravates that most terrible malady, sea-sickness; while the want of some means whereby a fire could be extinguished in a moment, in any part of a ship, has long been felt. John W. Richards, a scientific mechanic of this city, has invented and patented, this week, a means of ventilating and extinguishing fires in ships, which deserves especial notice. The invention, which is more particularly applicable on board of steam vessels, consists in the employment of a series of pipes having orifices or branches communicating with the spaces between the decks, cabins, state rooms, and hold, and the spaces between the timbers. These pipes have separate connections with a blowing apparatus and with a steam boiler, either of which can be opened at pleasure by the engineers or other persons qualified to have their control, for the purpose of introducing through them a copious supply of fresh air for ventilation, or if a fire occurs in any portion of the vessel, the air may be shut off from that and steam admitted thereinto in sufficient quantity to effect its extinction. By an improved mode of connecting and supporting the several lengths of pipe, provision is made for the convenient removal of any part that may be desirable or necesary to allow of the stowage of cargo or the packing of the pipes in a small compass, and every passenger has the pipes in his berth under his own control.

Automatic Oven.

Thomas Russell, of New York, has obtained a patent, this week, for an automatic oven, one that is remarkably simple and effective. The invention consists of a system of screws and endless chains, in combination with permanent ways or tracks leading from end to end of the interior and exterior and through the door-ways of a horizontal oven. having two doors on the same side, one for receiving the bread to be baked and the other for discharging it after baking, and a series of carriages to run on these ways, and carry bread. The doors of the oven are opened and closed by the carriages themselves, and all that has to be done is to deposit the dough on a carriage at one end, and the bread comes out properly baked at the other.

Variegated Wood.

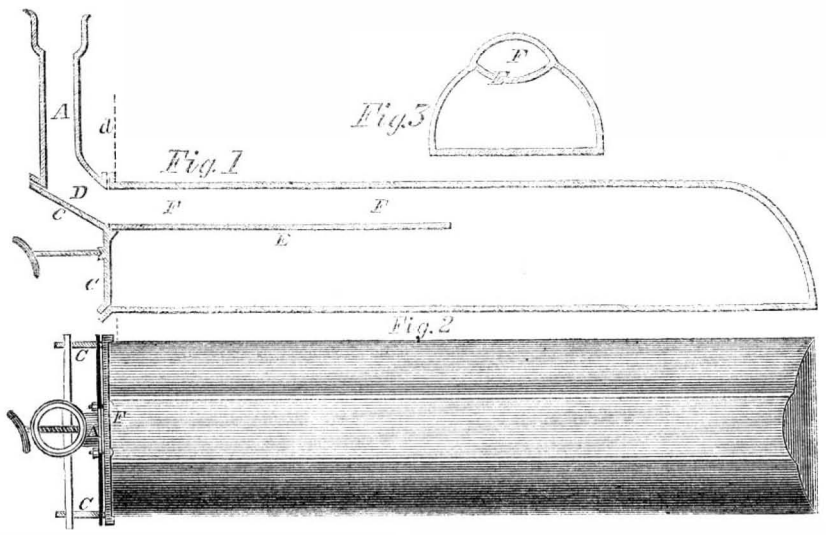
Joel Cowee, of Keene, N. H., has invented and patented a new and efficient method of producing a variegated appearance on the surface of wood, by making indentations or depressions in it in a direction running cross-ways to the fibres of the wood, by means of a fluted and plain roller, the plain roller being arranged in a pendulous weighted lever, whereby those parts of the timber which have been depressed by the projections of the fluted roller receive a different degree of compactness from those parts falling between the projections, so that the surface, when planed smooth, will have a variegated appearance.

New Gas Retort.

The retorts in which illuminating gas is made have occasionally to be taken from the stack or furnace and re-set, and this not only gives great trouble, but from the fact of the door and "stand-pipe" connection being an extra attachment, called the "mouth-piece" to the retort, which has to be taken off, it so disturbs the whole of the pipe joints, and renders them liable to leak. The subject of our illustrations is an invention which dispenses with the mouth-piece, and allows the retort to be set in the fire to dotted line, *a*, so that the heat acts equally on all parts of the contained coal, and the gas so made has to pass a short distance over a hot surface which increases its volume and illuminating qualities. With this retort, too, most of the tar is converted into gas, and what remains is carried up by the superior heat into the hydraulic main. The fireman has a better opening to charge through, and it is much easier of removal for re-setting, besides saving the weight of metal in the mouth-piece, usually about 300 pounds.

Fig. 1 is a vertical longitudinal section, Fig. 2 a plan, and Fig. 3 a cross-section.

SYMMES' GAS RETORT.

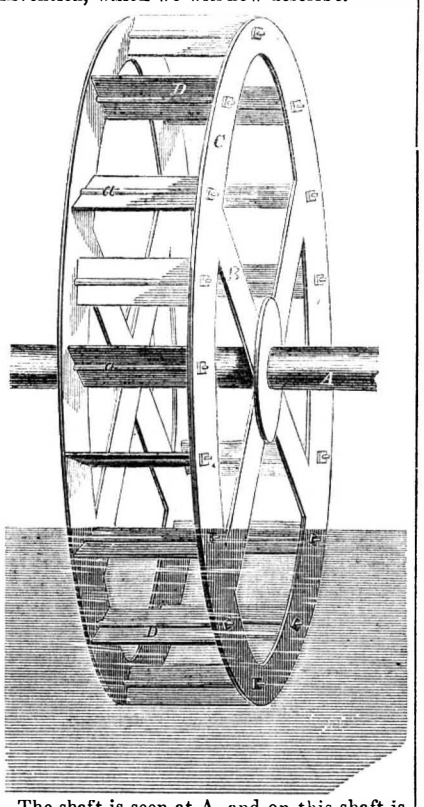


A is the bottom joint or elbow of the "stand-pipe," turning round to be parallel with the retort at D, which is cast with an elevated ridge, F, on the top, which forms a kind of pipe for the passage of the gases to the stand-pipe. The lower side of D is flat, and is closed by a lid or door, C, secured in the usual way, namely, by two lugs, a cross-head and screw. A flange, E, runs under F for about half the length of the retort, and forms a kind of pipe, to relieve the back of the retort, and as the gases from the front have also to pass through it, they are kept much longer in contact with the heated surface.

The inventor is H. K. Symmes, of Newton, Mass., and it was patented January 11, 1859. For further information the inventor should be addressed as above, and the retorts may be seen in operation at the works of the Newton and Watertown Gas Light Company, Watertown, Mass.

Orcutt's Paddle Wceel.

The subject of our illustration is a novel paddle wheel, invented by Nelson Orcutt, of Binghamton, N. Y., assigned to himself and G. W. Gregory, of the same place, either of whom will be happy to communicate with any person who may feel interested in the invention, which we will now describe.

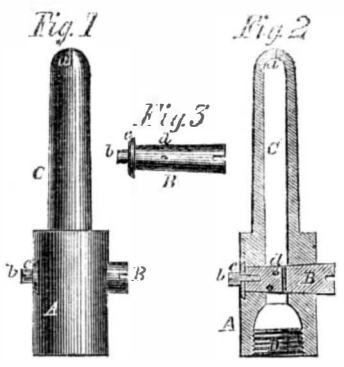


The shaft is seen at A, and on this shaft is supported a wheel, C, by arms, B. The two sides of this wheel are braced together by cross bars, *a*. The buckets or floats are formed of boiler iron or wood, having a circular channel running through their centers horizontally, through which is passed the cross bar or tie, *a*; and the buckets being perfectly balanced on *a*, can rotate freely on them.

The intention of this arrangement is, that when the bucket strikes the water, it shall strike it horizontally; and as the pressure is equal on both sides of its center, on which it is free to turn, it should always present a plane surface to the line of greatest resistance; and when it leaves the water, back water will not adhere to it, but fall off by its own weight, leaving the bucket free. Any number of buckets can be used, and the propelling effect, the inventor states, is very good. It was patented January 18, 1859.

Tozer's Gas Burner.

The prevalence of gas as an illuminating agent, and its increasing adoption throughout the country, renders the gas burner an article of some importance, and entitled to the consideration of inventors as an object for the exercise of their genius. Junius F. Tozer, of Binghamton, N. Y., has turned his attention to them, and has effected a considerable improvement. With the ordinary burner the amount of gas consumed per hour depends entirely upon the size of the orifice, and as by oxydation or other cause, that becomes enlarged, the quantity of gas consumed rapidly increases; the varying pressure on the mains also altering the amount of gas passing through the burner.



In this improved burner, C, seen in perspective in Fig. 1, and in section in Fig. 2, a small three-way cock, B, is introduced in the base, A, provided with holes, *d*, each capable of admitting two, four or six feet of gas to pass through them respectively. Of course, these holes can be made any size, but those mentioned are the more general ones. B is conical-shaped, and is held in its place by the small collar, *c*, and screw, *b*, seen more distinctly in the detached view, Fig. 3. The aperture of the burner is seen at *a*, and the thread by which the burner is secured to the pipe is indicated by D. This cock, B, can be turned by a knife or any similar instrument to bring either of the three holes vertical, and so admit the gas from the pipe to the burner in a regular and regulated flow. The ordinary cock in the supply pipe or branch may be continued or dispensed with, a thought necessary by the person using the invention.

The inventor obtained a patent October 5, 1858, and assigned the invention to G. W. Gregory, of Binghampton, N. Y., who may be addressed for further information.

Envelope Machine.

J. B. Duff & T. W. Keating, of New York, have invented and patented a pasting apparatus for pasting or gumming envelopes, by which the pasting in any part of the envelope, except where it is required, is effectively prevented. There is also in the machine a novel contrivance for creasing the blanks in the lines in which the folds are to be produced, and the lappers by which the folds are finished are of improved construction. The claim will be found on another page.

"Why do not Ladies Skate?"

And echo replies, "Why not?" In Holland, one of the most pretty sights in the winter time is to see the bright-eyed Dutch lasses skating along the canals to market, and the graceful action it induces tends not a little to give that easy carriage of the person which is so envied by our belles. The exercise is truly healthy, and would give a color to the cheeks more brilliant than rouge, and a charming brightness to the eye which nothing but Nature's own free air can impart. Ladies, our winters are long enough, and our air is pure and bracing—you have the opportunity to acquire in the open air in winter a stock of health, beauty and natural elegance to carry you through the duties of home or the pleasures of the ball with *eclat* and cheerfulness, if you will but improve it. Ladies, skate!

Yankee Locomotives in Egpyt.

On the railway between Alexandria (Egypt) and Suez, recently finished, there are four locomotives,—two of them are of English manufacture, and the other two were built at Mason's Works, Taunton, Mass. It seems that the Pasha's ears are open to flattery, and the English engineers, through their Consul, use every possible means to get rid of the American engineers. They were told by the railway company that the engines were not going to be used, and that their services would not be needed. The excuse for giving them up was that they are not strong enough to haul the heavy trains. One of the Americans, getting an opportunity to speak with the Pasha, told him he could haul as many loaded cars as would reach from one end of the road to the other. Accordingly seventy-five heavy loaded cars (which was all they could muster) were put in a train, the Pasha's own car attached and the whole taken through to Suez, a distance of 200 miles, in twelve hours, making stoppages for fuel and water. The Pasha exclaimed, in Egyptian, —"God is great, but a Yankee is very near perfection!" On his return he discharged the English engine drivers and now uses the Taunton engines altogether.

Signing Drawings—How it Works.

MESSRS. EDITORS—You will excuse my stating that the Commissioner of Patents, in enforcing his order in my case, is working most disastrously to my interests; but I am pleased to acknowledge the promptness with which you have attended to my last thus far.

R. B. N.

Sacramento, Cal., Jan. 4, 1859.

[The above is a specimen of the letters we are receiving from our clients in California, and other remote places. This gentleman's specification had been sent to him for execution long before the rule requiring the signing of drawings had been promulgated. Under like circumstances, we made strenuous efforts to induce the Commissioner to postpone the enforcements of the rule, but our exertions were spent in vain.

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Scientific American.

NEW YORK, FEBRUARY 12, 1859.

REMOVAL.

The SCIENTIFIC AMERICAN *Office has removed from its old location,* 128 *Fulton st. (Sun Building), to No.* 37 *Park Row (Park Building) where all letters, packages, and models should hereafter be addressed. Entrance is had to the Office also at No.* 145 *Nassau st. Munn & Co.'s American and European Patent Agency is at the above office.*

Body and Brain.

When a Mohammedan wishes to pass a very high eulogy upon a deceased friend, he tells you that he "had a good liver," which means that the said friend was always good and pleasant in body and mind. This is a most expressive sentence, especially in climates where the liver is easily affected, and it shows that the sons of Islam are well acquainted with the fact which we wish to enforce, namely, that the healthy action and clear conception of the brain depends more than is generally believed upon a sound and healthy physical organization.

No argument is required to convince every person that, at the present time, they must *think*, would they succeed in life, and that mere plodding is scarcely required, the demand being for educated labor; and this remark applies not only to one trade, but all trades—not to one profession, but all professions—artist and artificer, painter and preacher, all alike. This being granted, it will be seen of what vast national and individual importance it is that the seat of reason should be undefiled, and that the channels of thought should be ever clear and free. A professional humbug who would advertise a quack medicine to overcome that brain fatigue which sleep does not seem to conquer, and to give renewed activity to the worn-out mind, would make a fortune shortly, for the complaint is a common one. Bodily disease, the disregard of the grand physical laws of cleanliness and exercise, inherited sickness and personal intemperance, are the great barriers to true progress which have yet to be vanquished and pulled down.

Let us take the two first, and see how they affect the mainspring of action—the brain. Take the illustration of a watch. The mainspring may be perfectly good and sound, but some little wheel in the train of motion being displaced, it will not tell true time. A spring may be clear when it bubbles forth from the virgin soil, but an impurity in the water course will taint the whole stream. A statue may be graceful in form and elegant in proportion, but when seen in an uneven mirror it becomes distorted and out of shape. The mind may be active, clear, and perceptive; but if some little pinion, some small disease, local or general, be in the body, it cannot act upon the outer world with force and originality, because the medium through which it acts is tainted and unhealthy. Again, if the ear be out of order, the brain can obtain no true notion of sound; if the eye be diseased, a perfect sight is never taken, and the same is true of feeling, smelling and tasting. Now, suppose that instead of any one sense being considerably affected, all are partially so, how then is the brain going to derive impressions correctly, on which to base future thoughts and resulting actions, if the courses through which those impressions flow from the object observed to it are tainted, impure or diseased. Thus we see that the mind and body are so intimately connected that we cannot separate the two, and the one cannot be diseased without affecting considerably the tone of the other. For a mind diseased, or one that may become so—in fact, for every one of us—there is nothing like plenty of fresh air and simple food, a decent modicum of exercise, the encouragement of cleanliness by ablution with cold water, as much of the light of heaven and as little of the light of oil, spirits or gas as possible. If we can but as a people begin to believe this, we shall quickly perceive the truth of the prescription by the happy results which will follow. Let us all, for once, learn something from the children of the Prophet, and strive to earn that eulogy so full of peaceful meaning and pleasant thoughts of contented health—"He had a good liver."

Meterology.—Interesting Fact.—No. 3.

Without warm breezes and frequent rains, no country is fit for the abode of man. The rains clothe the fields with verdure; their absence makes the land a barren wilderness. On the western portion of our country lying on the Pacific Ocean, a belt of rains accompany the sun in his annual course north and south, and produce the rainy seasons of California and Oregon, without which these countries would be unfit for agriculture. On the eastern side of the mountain ranges of the Pacific, the case is very different; but little rain falls upon the elevations or the valleys, hence there is a wide expanse which never can be inhabited, as it is only a barren waste, and must ever so remain, as all the science and skill of man cannot make the rains, nor change the course of the winds.

Two great ranges of mountains run north and south through our continent, namely, the Rocky Mountains on the west, and the Appalchian chain near the Atlantic on the east. There is a great broad interval between these, which is called the "Mississippi valley." This depression runs north to the Arctic Ocean, and south to the Gulf of Mexico. The western mountains gradually decrease in elevation towards the north, and as there is no northern range, the north and north-west winds have a free sweep down the Mississippi valley; consequently, when these prevail in winter, the cold is very severe on our western prairies; this also affords a reason why it is sometimes colder as far south as St. Louis than it ever is in New York. The Gulf of Mexico is a huge steam cauldron; it evaporates an immense amount of moisture; this is carried up by south winds through the valley of the Mississippi and by south-west winds along the whole eastern coast. This moisture as it proceeds onward is condensed, and falls down in grateful showers to refresh the soil, and enable it "to bring forth seed for the sower, and bread for the eater."

As a great amount of electricity is developed by the evaporation of water, the Gulf of Mexico is the principal source of that which is observed during thunder storms; hence the reason why almost all such storms come from the Gulf. The moisture which flows up the great Mississippi valley does not reach far west—seldom beyond the 98th meridian. East of this the soil is fertile, because it is amply refreshed with rains; west of it, up to the Rocky Mountains, denominated the "great American plains," all is a barren wilderness—there is not an object of delight to the eye to be seen. On the Pacific coast, with the exception of a belt along the ocean, barrenness also prevails, owing to the absence of fertilizing showers. Were it not for artificial irrigation, the valley of Salt Lake could not afford sustenance for man or beast. In traversing this great barren track, whole days are passed without meeting with a single spring or rivulet to slake the thirst of the weary traveler. Over the greater portion of Sonora and New Mexico sterility reigns supreme; and at Fort Defiance, a range of fifty square miles is necessary for grazing, and procuring hay for the animals of the garrison.

If the map of the United States is examined, it will be observed that the 98th degree of west longitude divides it into two nearly equal parts. As all the western portion (until the belt on the Pacific is reached) is a barren wilderness, this fact must dissipate some of the waking dreams in which many persons have indulged regarding the future agricultural greatness of the far western portion of our country. The eastern portion of the Mississippi valley, by the laws of nature, must forever remain the granery of the United States.

Rejected Patents.

Senator Seward has submitted a resolution, which was referred to the Committee on Patents and the Patent Office, as follows:—

"*Resolved*, That the Secretary of the Interior be instructed to cause to be prepared, during the recess of Congress, a list of all rejected and suspended applications for patents for inventions, from 1840 to the 1st of December, 1859, naming the cause of rejection and suspension, with the name of the inventor and date of his application, and report the same to the Senate, on the convening of the next Congress, for the confirmation and consideration of the Senate."

This is certainly a very curious resolution, and we are curious to see what will come of it. There are thousands of rejected applications in the Patent Office, and in each case, the Commissioner of Patents has given his reasons for the rejection in writing, and in many cases a voluminous correspondence has transpired. The facts in each case are all matters of record, and by the employment of an adequate clerical force, the Secretary could furnish Congress with the information sought for by the resolution. What is the result? Some time during the month of December next, a drayman knocks at the door of the Senate Chamber, and empties a stack of manuscripts upon the floor in front of the Vice-President's desk, and upon being interrogated about them, informs the grave and reverend Senators that the Secretary of the Interior sends an answer to Senator Seward's resolution about rejected applications for patents. Like the Frenchman who purchased the elephant, the enquiry starts, what shall we do with this case? Here is the information, of what use is it to the Senate? Who shall read it? Who shall attend to examining the thousands of references ranging among books innumerable and in all languages, as well as among twenty thousand models, in the Patent Office? Possibly, here is a job for the printer, and possibly, for a "Patent Adviser to the Senate, on rejected applications for patents," whose opinion must be had before the rejected case can be *confirmed*. It strikes us that this is a very eccentric move, and we cannot yet see what practical end can be gained by its prosecution.

The Telescope.—Invention and Learning.

It was the telescope, not the science of mathematics, which laid the foundation and perfected the science of astronomy. Take away the telescope, and our knowledge of astronomy would become as elevated as that of the peasant, who considered the moon to be "no larger than his grandsire's shield." During a recent lecture, delivered in this city, by Professor Mitchell, he paid a just tribute to the grandeur and merits of this instrument. He said:—"How could man project himself among those wandering worlds? Then when the eye could go no further, this wonderful instrument—the telescope—was invented. It has become so familiar that we forget there is anything marvelous about it. Suppose that the same thing could be done for any one of the other senses. Imagine an instrument which could enable us to hear the debates in Congress, or even more, one which could bring the Parliament Houses of London so near that every word spoken there could be understood here. The wonder such an invention would excite would only be equaled by that which we should feel when we contemplate the telescope which does the same for the eye. It does more for man than the famous carpet told of in the *Arabian Nights*. Transported by this wondrous tube, man goes from planet to planet; he passes the limits of our universe; he sweeps away through millions and millions of miles, which human arithmetic fails to reach, until his mind is lost in the very immensity of space. Yet there are difficulties with which the astronomer has to contend in the use of this instrument. The first is the annual and diurnal revolution of the earth. But an obstacle greater than this is the difficulty of fixing some definite point in space to which all his observations can be referred. You ask, why he cannot refer them to the fixed stars? Because they are *not* fixed; for the telescope reveals the fact that they are moving. So we are obliged to determine the ascension and declination of a heavenly body, as we determine the locality of places on the globe, by longitude and latitude. The astronomer's time begins when the vernal equinox is on the meridian. If that spot could be fixed many of the difficulties attending the determination of right ascension would be removed. But the vernal equinox itself is moving."

One of the greatest difficulties in the construction of telescopes is making the pivots properly. Professor M. described a visit to Munich and its mathematical instrument makers, where he saw a large piece of iron being shaved down with a diamond; all this nicety—all this skill—is not enough, and man is obliged to appeal to the stars themselves—those mighty land-marks God has placed in the heavens—to tell the exact variation of his instruments. Professor M. said he never stood in the presence of one of these wonderful instruments without feeling almost as though he stood before a superior power. It seemed as if it were the eye of God itself, so much it revealed to man's limited vision. He expressed the opinion that the limit of its discoveries has not yet been reached. Professor M. then discussed the space-penetrating power of the telescope. Sir William Herschel first tried experiments to determine this. Is it impossible," he asked, "to send out a sounding line which shall pass beyond these clusters of stars and sink down in the space beyond them? Now if stars of the sixth magnitude are rendered so indistinct because they are so distant in space, we get at the space penetrating power of unaided vision. If light would come from stars of the first magnitude in ten years, it would take 150 or 160 years for it to come from those of the sixth magnitude. Herschel found that his great reflector reached 2,300 times further than the naked eye. 'End there is none to the universe of God! Lo, also, there is no beginning.'"

Professor Mitchell has just finished a course of six astronomical lectures at the Academy of Music, and must have carried away with him a most gratifying recollection of our people, since no other lecturer of the season has been better received or more highly appreciated.

Expansive Gases for Motive Power.

A correspondent writing to us from Kingston, Tenn., says:—"It strikes me that steam must yet give place to hot air. It may be a great while before this result will be brought about." The plan he proposes to attain the end in which he has so much faith, as a future certainty, is to use a strong iron chamber similar to a steam boiler, pump the air into it, heat it highly, and work it in the same manner as steam. He thinks that this air chamber and the cylinder of the engine may be enclosed in a furnace, and heated red hot. We give the substance of this letter to convey some useful information to its author and the public at large.

Air when heated to 491° Fah., and confined in a close vessel, only exerts a pressure of 15 pounds to the square inch. Steam of 400° Fah. exerts a pressure of 240 pounds on the square inch. In the one case we have a high pressure with a low temperature, and in the other (that of air) a low pressure with a high heat. All gases are subject to the same law of expansion by heat, and steam heated apart from water can be used in the same manner as hot air, and with the same results.

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The Manufacture of Coal Oil.—The First Patent.

The manufacture of coal oil has become somewhat extensive in our country, and the subject at this time is one of great importance. We have had a great number of inquiries regarding the history of this invention, and the extent of the claims of the person who obtained the first patent for it. For this reason we have sent for a copy of the patent, and hereby publish it in full. The description of the whole process is very clear. Our opinion in regard to the claims will be found at the end of the specification:—

To all whom it may concern:

Be it known that I, James Young, of Manchester, England, have invented improvements in the treatment of certain bituminous mineral substances, and in obtaining products therefrom, and do hereby declare the following to be a full, clear and exact description of the same. My said invention consists in treating bituminous coals in such manner as to obtain therefrom an oil containing paraffine (which I call paraffine oil), and from which oil I obtain paraffine. The coals which I deem to be best fitted for this purpose are such as are usually called "Parrot coal," "Cannel coal," and "Gas coal," and which are much used in the manufacture of gas for the purpose of illumination, because they yield, upon distillation at a high temperature, olefiant and other highly illuminating gases, in considerable quantity; and although some coals last described contain a large amount of earthy matters, these matters do not interfere materially with the performance of my process.

To obtain paraffine oil from coals, I proceed as follows:—The coals are to be broken into small pieces of about the size of a hen's egg, or less, for the purpose of facilitating the operation. The coal is then to be put into a common gas retort, to which is attached a worm pipe, passing through a refrigerator, and kept at a temperature of about 55° Fah., by a stream of cold water. The temperature of the refrigerator should not be made too low, lest the product of distillation should congeal, and stop up the pipe; and I find that a temperature of about 55° Fah. is sufficient. The retort being closed in the usual manner, is then to be gradually heated up to a low red heat, at which it is to be kept until volatile products cease to come off. Care must be taken to keep the temperature of the retort from rising above that of a low red heat, so as to prevent, as much as possible, the desired products of the process being converted into permanent gas. The coke or residue may then be withdrawn from the retort, which, being allowed to cool down below a visible red heat (to prevent waste of the fresh material to be introduced), may be again charged with a quantity of coals, to be treated in like manner as I have described. The crude paraffine oil distilled or driven off from the coals as a vapor will be condensed into a liquid in passing through the cold worm pipe, from which it will fall into a vessel which must be provided to receive it. Instead of obtaining the whole of the paraffine oil by distillation, or driven off as just described, a portion of it may, in some cases, if thought desirable, be run from the retort through an opening and pipe to be provided in the anterior and lower part of the retort for that purpose, after it has separated from the coal, and assumed a liquid form. I prefer, however, in every case, to distill or drive off the whole of the paraffine oil to be obtained from the coal. The production of the desired products from a charge of coals in a retort will be known to be finished by the liquid ceasing to run from the worm. The crude product of this process is an oil containing paraffine, which, as I have already stated, I call paraffine oil. This oil will sometimes, upon cooling at a temperature of about 40° Fah., deposit paraffine.

Other arrangements of apparatus may be used for subjecting coals to the process for obtaining paraffine oil therefrom, as I have described; but I prefer to use the apparatus above-mentioned, as being well known and easily managed. But in order to obtain the largest quantity of crude paraffine oil from coals by means of this process, and produce the smallest quantity of permanent gas by the action of the heat employed, whatever may be the apparatus used, care must be taken to heat the coals gradually, and to apply the lowest temperature necessary to complete the operation. During the distillation or driving off which I have described, a permanent gas will be produced, and this gas may either be collected or suffered to escape, as may be thought expedient.

I purify the crude oil obtained as already described, in the following manner:—I put the oil into a cistern, and heat it (by a steam pipe or other means) to a temperature of about 150° Fah. When thus heated, water and undissolved impurities contained in the oil will separate more readily from it than when cold, and the oil being left in a state of rest, and kept warm for about a day, many of those impurities will fall to the bottom of the cistern, and the oil may then be run off into another vessel, leaving the residuum behind. I then proceed to distill the oil, for which operation I prefer to use an iron still with a worm pipe connected to it, passing through a refrigeratory apparatus, as beforementioned, the refrigerator being kept at or about the temperature of 55° Fah., as I have already mentioned. I heat the still by a fire underneath it, which I keep up until the whole of the oil has been distilled over, and it will then be found that the still contains some dry carbonaceous residuum, which should be taken out before the still is again used. The oil is to be run from the condensing apparatus, as it distills over, into a leaden vessel, where to each one hundred gallons I gradually add ten gallons of the oil of vitriol of commerce. After this mixture has been well stirred for about an hour, I allow it to remain at rest for about twelve hours, so that the oil of vitriol, and impurities with which it has combined, may settle at the bottom. I then draw off the supernatant oil into an iron vessel, and to each one hundred gallons I add four gallons of caustic soda of a specific gravity 1·300, water being 1·000.

The soda and oil are stirred together for about an hour so as to neutralize any acid which may remain in the oil, and also take up any impurities capable of combining with it, after which the contents of the vessel are allowed to remain at rest for about six or eight hours, so that the solution of soda may subside, and then the supernatant oil is to be drawn off and again distilled in the same manner as I have already described. Paraffine oil obtained from the last mentioned distillation contains a fluid more volatile than paraffine, and I separate a considerable portion of this fluid from the oil and obtain it in a separate state, as follows: I put the oil into an iron still connected with a worm-pipe passing through a refrigeratory apparatus adding to the oil half its bulk of water and boiling the contents of the still for about twelve hours, adding water from time to time so as to keep about the same proportions of the oil and water in the still. The volatile fluid will pass over along with steam, and can be condensed in the worm-pipe by the refrigeratory apparatus. This fluid will be clear and transparent, and as it is lighter than water it separates on standing from the water with which it will be mixed as it leaves the worm-pipe of the still.

This fluid may be burnt for the purpose of illumination or applied to any other useful purpose to which it may be applicable. The last-named process will separate the greater portion of the volatile fluid I have mentioned from the oil, but a larger quantity may be separated by prolonging the operation. The oil left in the still, after the completion of the process lastly described, is then to be carefully separated from all the remaining water (upon which it will float), and conveyed into a leaden vessel, where to each one hundred gallons I add two gallons of oil of vitriol. This mixture is to be well stirred for six or eight hours, after which I allow it to stand undisturbed for twenty-four hours, in order that the vitriol may settle to the bottom of the leaden vessel, carrying with it all impurities with which it has combined. The supernatant oil is now to be drawn off into another vessel, and to each one hundred gallons there is added twenty-eight pounds of chalk ground up with a little water into a thin paste. The oil and chalk are then to be well agitated until the oil becomes freed from all sulphurous acid. This oil is to be kept warm, say at 100° Fah., in any convenient vessel for about a week, to allow impurities to settle, and it is then fit to be used for lubricating purposes either by itself or mixed with an animal or vegetable oil, or it may be burned by itself in argand lamps for the purpose of illumination, and this oil may be further purified, if required, by distilling it over again. To extract paraffine from the purified oil obtained in the manner I have described, the oil is to be cooled to a low temperature, say to 30 or 40 degrees Fah., and the lower the temperature the larger will be the quantity of paraffine separated from the oil. In this way paraffine is made to crystallize, and in this state it may be separated from the oil by filtration through woolen or other cloths, and then squeezing it in a powerful press, by which means it will be made sufficiently pure to be employed for lubricating and some other useful purposes. But the paraffine may be further purified, if required. by treating it several times at a temperature of about 160° Fah., alternately with its low bulk of oil of vitriol, and with a similar quantity of a solution of caustic soda (of the specific gravity already mentioned) until the paraffine ceases to render the oil of vitriol black. It is then to be washed in a weak solution of soda, and lastly with boiling water, until the water ceases to change tke color of red litmus paper. To obtain paraffine from paraffine oil I sometimes put the oil into a still and distil over one half or more of its contents. The portion then remaining will contain a much larger proportion of paraffine than the paraffine oil at first put into the still contained. This residue being then distilled over into a separate vessel, and allowed to cool, paraffine may be separated by filtration and squeezing in cloths, and also purified by treatment with oil of vitriol and soda, as before described. Paraffine oil from which paraffine has been separated, as above described, still contains paraffine in solution, and is suitable for lubricating or lighting purposes, as already mentioned.

What I claim as my invention, and desire to secure by Letters Patent, is the obtaining of paraffine oil, or an oil containing paraffine and paraffine from bituminous coals, by treating them in manner herein before described.

JAMES YOUNG.

Mr. Young obtained his patent in England October 7, 1850, and in the United States March 23, 1852. By our law the patent endures only till the English one expires, which is in October, 1864. So far as we know, the patentee is the discoverer of the method of obtaining oil from coal and bituminous shales, by distilling them in retorts at a heat below that of destructive distillation. This seems to cover the manufacture of all coal oils by distillation in essence and principle, and unless it can be proven that some person had made the discovery prior to Young, he will be sustained in this position. It will be noticed that no claim is set up for the apparatus, nor the particular process, excepting the feature that paraffine or coal oil is obtained by it.

Pressure on Slide Valves.

MESSRS. EDITORS—In your issue of January 15th, you state that the amount of pressure on a slide valve is to be found by multiplying the pressure in pounds per inch by the area of the face in inches, less the surface projecting over the valve-seat or ports, or both. Now, I have been informed that recent experiments made at Paterson, N. J., prove that the amount of pressure on a slide-valve is only equal to the area in inches of cavity or ports beneath, multiplied by the pressure in pounds (making an allowance, of course, for any pressure that may exist on the opposite side), and also that two surfaces (perfectly true) without any openings in either, may be reciprocated with the same ease under pressure as when exposed to the atmosphere alone.

As this is a subject important to engineers and others, I should like very much to know if your explanations are founded on facts adduced by experiments, or if they are based on theory alone.

ADAM S. CAMERON, M. E.

New York, January, 1859.

[If the experiments mentioned by Mr. C. showed the results stated by his informant, they showed also, most conclusively, that the faces of the valves were not properly fitted to their seats, or that they had been worn to such a condition as to be in great necessity of being re-fitted. If two bodies having perfectly true and smooth plane surfaces are placed together in the atmosphere, all the air is excluded from between them, and there is a pressure equal in amount to the pressure of the atmosphere on the whole surface of contact, operating to confine them together. We have seen plates of metal so fitted that the upper one would lift the under one, and they could not be separated without sliding one off the other, and a slide-valve of the common kind, if properly fitted, is acted on in a similar manner by the pressure of steam. An every-day illustration of this action of the atmosphere may be seen in any marble works in the process of polishing, performed by rubbing two slabs together. We think these remarks of ours will convince our correspondent, on reflection, of the correctness of our mode of estimating the pressure on the valve.—EDS.

Correspondents

NUMBERS 4, 14, 17, and 19, this volume of the SCIENTIFIC AMERICAN, cannot be supplied, as we are entirely out of them.

E. H. B,, of Conn.—To make up a transparent varnish to preserve saws from rusting, boil up a quart of linseed oil for an hour and add two ounces of flower of sulphur, very gradually, apply it to the metal with a brush, and allow it to dry.

J. S., of ——. There is no published work which will enable you to judge of the merits of rival machines. There seems to be some novelty in your gate. You had better try it before spending much money upon it.

J. A., of Conn.—All the tobacco pipes used in our city are imported: we believe that none are manufactured in our country. The Salisbury iron ores are brown hematite, we believe. Pig iron from magnetic ores is made at Keesville, N. Y. You can obtain black schist at any of the bituminous coal mines.

J. K. G., of Mich.—All varnish that contains oil is liable to become yellow in color as it grows old, after it is applied. Hard spirit varnish maintains its color, but is liable to crack as it becomes old. It is made by dissolving any of the white resins in alcohol.

A, S. M., of Conn.—A large boiler cannot sustain as much pressure as a small one of equal thickness of metal. The strength diminishes as the diameter is increased.

P. G., of Florence.—If you inform us in what State you reside we will address you by letter. There are fifteen Florences in Uncle Sam's family of Post offices.

C, D. E., of Ind.—It is impossible to give you correct information regarding the best speed for your carding-roller. Much depends on the materials and construction of the machine. Write to the maker of the machine and he will give you the exact speed at which it can be safely run.

J. S. of N. Y.—The roofs of houses in New York covered with tin soon become rusty, because the rains which come from the Atlantic Ocean contain saline matter, which oxydizes the metal. In the northern part of New York and Canada, tin roofs require no paint, because the rains in these sections contain no saline matter. Alcohol does not deteriorate when kept in casks in a very cool place. None of the burning fluids explode; they must first be converted into gas and mixed with the air. Camphene converted into gas and mixed with air is explosive.

O. H., of Cal.—Any invention which is allowed by its author to be used freely by the public for two years prior to the application for the patent, becomes public property. This affords an answer to all your questions.

E. A. H., of Ind.—The decision in the case of the Wheeler & Wilson patent, as we understand it, gives you the right to work under the old patent, or the reissue, just as you select.

M. A. K., of Ill.—Your safe may be perfectly fireproof and yet not be frost-proof, as the metal acquires the temperature of the atmosphere, and the fire-proof qualities of the composition are not called into action by decrease of temperature.

C. R. J., of N. Y.—Meteorological records kept for a hundred years do not afford the least evidence of a change in the seasons. The winters are as cold, and the summers as warm now as formerly.

H. M. of N. Y.—Large sheets of thin iron may be case-hardened by heating them nearly red-hot, then rubbing a piece of horn or hoof over their surface, submitting them to heat again, and tempering by plunging in cold water.

A. F., of Vt.—We are not able to refer you to any one who makes lathes for irregular turning—spokes, helves, &c.

D. B. R., of Ill.—A stamp or die like that you name would cost you 12½ cents per letter in this city. Tin melts at 430° Fah., and if you add about 4 per cent of copper to it, you will obtain a hard alloy which will melt below 500° Fah.

J. K. A., of Ill.—Barbers still use a striped pole for a sign, because it is a relic of their former craft in bloodletting; the stripes were the signs of the bandages they used, for tying up the arm.

R. M. S., of N. C.—It is our opinion that the best results will be obtained from any fertilizer if spread thinly upon grain after it has sprung up. It should be spread on at several intervals, upon the same principle as fertilizing agents are applied in Holland, namely, in the liquid state. If this cannot be done, the next best method is to spread it all on the ground at once, and plow it in just prior to sowing the grain.

G. H., of Conn.—To make a steel core draw easily out of a casting, brush it with turpentine, and allow it to dry before you put it into the mold.

A. N. T., of N. Y.—We are not familiar with that law of acoustics by which the ventiloquist astonishes his fellow-man.

J. K. H. W., of N. Y.—There is no public observatory in this city or vicinity; nor do we know of any private one where you could be admitted occasionally.

N. D., of N. Y.—The principle involved in your proposed self-motor is the same as that developed when one attempts to lift himself over a fence by simply pulling upon the seat of his pantaloons. The reasons of failure are the same in both cases.

R. B., of Conn.—We have seen a brake made to operate on the top of a car wheel, but it is more convenient, and quite as effective to secure it in line with the axle.

J. B., of Chenango co., N. Y., thinks that if any inventor could produce a self-raking and self-loading hay wagon, it would have an extensive sale in that vicinity, and in every agricultural section.

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Money received at the Scientific American Office on account of Patent Office business, for the week ending Saturday, February 5 :—

L. B. H., of N. Y., $20; J. K. L., of W. T., $55; T. J. S., of La., $32; S. L. B., of S. C., $30; P. C. J., of L. I., $30; G. B., of N. J., $30; J. C. D., of Ky., $35; G. S., of N. Y., $30; M. E. & Co., of Ill., $50; J. L., of Ind., $25; T. J. De Y., of Pa., $10; A G. B., of Ohio, $25; H. C., of Pa., $60; A. F. L., of N. C., $25; J. T., of N. Y., $30; S. E. B., of N. Y., $10; J. M., of Pa., $25; W. H. S., of R. I., $60; S. S., of L. I., $25; A. S. B., of Conn., $50; D. F., of Ohio, $25; H. S. C., of Pa., $30; S. F. J., of Ind., $30; T. T. C., of L. I., $10; J. M., of N. Y., $275; H. W. H., of Conn., $35; S. D. L., of Mich., $25; E. B., of Md., $30; M. D., of Mass., $25; K. F., of Wis., $30; I. M., of Mich., $30; J. W. McL., of Ind., $30; D. A. W., of N. Y., $65; R. & W., of N. Y., $30; C. & B., of L. I., $30; D. & B., of N. J., $25; J. J., of L. I., $27; J. B., of N. J., $57; R. S. L., of Conn., $30; J. L. H., of Pa., $20; E. B., of Mass., $32; W. H. G., of N. Y., $30; W. & R., of Vt., $25; S. W., of Vt., $55; A. C. G., of N. Y., $29; G. P. J., of Iowa, $35; J. C. S., of Mass., $85; C. M., of N, N. J., $30; C. T. P., of N. Y., $100; W. S. K., of Conn., $25; E. W., of Mass., $10; S. R. H., of Mich., $30; H. F. B., of Ind., $55; L. B., of Cal., $30; L. M., of N, Y., $25; J. M. M., of N. Y., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, February 5 :—

D. F., of Ohio; W. H. B., of Mass.; S. D. L., of Mich.; &. C. G., of N. Y.; J. N. D., of Ky.; H. C. of Pa.; J. J., of L. I.; L. B. H., of N. Y.; D. & B., of N. J.; A. S. B., of Conn. (two cases); V. L. M., of Pa.; M. E. & Co., of Ill.; A. G. B, of Ohio; S. S., of L. I.; J. M., of Pa.; J. B., of N. J.; T. J. S., of La.; J. A., of La.; L. M., of N. Y; J. L., of Ind.; M. D., of Mass.; J. J. C., of Mo.; A. F. L., of N. C.; I. D., of Mass.; J. M. M, of N. Y.

IMPORTANT TO INVENTORS.

AMERICAN AND FOREIGN PATENT SOLICITORS.—Messrs. MUNN & CO., Proprietors of the SCIENTIFIC AMERICAN, continue to procure patents for inventors in the United States and all foreign countries on the most liberal terms. Our experience is of thirteen years' standing, and our facilities are unequaled by any other agency in the world. The long experience we have had in preparing specifications and drawings has rendered us perfectly conversant with the mode of doing business at the United States Patent Office, and with most of the inventions which have been patented. Information concerning the patentability of inventions is freely given, without charge, on sending a model or drawing and description to this office.

Consultation may be had with the firm, between nine and four o'clock, daily, at their principal office, 37 Park Row, New York. We established, over a year ago, a Branch Office in the City of Washington, on the corner of F and Seventh streets, opposite the United States Patent Office. This office is under the general superintendence of one of the firm, and is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such cases as may require it. Inventors and others who may visit Washington, having business at the Patent Office, are cordially invited to call at our office.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

We are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business we have offices at Nos. 66 Chancery Lane, London; 29 Boulevard St Martin, Paris; and 26 Rue des Eperonniers, Brussels. We think we may safely say that three-fourths of all the European patents secured to American citizens are procured through our Agency.

Circulars of information concerning the proper course to be pursued in obtaining patents through our Agency, the requirements of the Patent Office, &c., may be had gratis upon application at the principal office or either of the branches.

TO RENT—THE EXTENSIVE FOUNDRY, Machine, and Smith Shops, known as the "Norris Works," in Norristown, Pa., on railroad and navigation, 16 miles from Philadelphia; together with one of the largest assortments of patterns in this country for high and low pressnre and Cornish Engines, of the largest capacity for water-works and mines, Cornish Pumps, Ore Crushers, Mill Gearing, Wheels, Pulleys, Mining Machinery of the most approved kind, &c. This establishment is capable of doing a business of $150,000 per annum, and will be rented on percentage for all work done at the establishment. This is an opportunity for a party of men to make a fortune, without risk. For particulars, address M. C. BOYER, Norristown, Pa. 1*

STEAM ENGINES, SLIDE LATHES, Planing Machines, Drills, &c.—Orders taken for all descriptions of machines for working in wood or iron. Address CHARLES H. SMITH, Machinery Depot, No. 135 North Third st., Philadelphia. 23 4*

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CALIFORNIA AGENCY FOR PATENTS—WETHERED & TIFFANY, San Francisco, will attend to the sale of patent rights for the Pacific coast. References :—Messrs. Tiffany & Co., New York; Wethered, Brothers, Baltimore; George W. Ponds & Co., Boston. 23 13*

CROSSETT'S PATENT STAVE CUTTER—Patented July 1, 1844; re-issued March 2, 1858; renewed and extended June 26, 1858. The above-mentioned machine is warranted to cut more and better staves than any other machine in the United States, and is the most simple, cheap, and durable. I hereby caution all persons against using and vending said machine (the main features of which consist in the stationary knife and vibratory bed-piece) without the legal right to do so. Offenders will be dealt with according to law. All persons wishing an interest in the extended term of said patent can obtain it by addressing the undersigned at Joliet, Ill.

21 7* GEO. I. CROSSETT, Assignee.

THE WILLCOX & GIBBS' REVOLVING Looper Sewing Machine (illustrated in SCI. AM., Vol. 14, No. 21), is manufactured and for sale by JAS. WILLCOX, No. 715 Chestnut st., Philadelphia. This machine more fully meets the requirements of families than any heretofore produced, being at once simple, the workmanship perfect, and hence reliable. Competent agents are wanted. 21 4*

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WM. H. BELL. } Architect and Superintendent.

We respectfully refer to the following gentlemen and companies as our references :—Gerard Stith, (Mayor), C. M. Waterman (ex-Mayor), A. Giffen (City Treasurer), S. F. Marks (Postmaster), C. Rosclius, L. E. Forstall, J. W. Zacharie, E. Roger & Co., J. L. Carman & Co., D. E. Morphy, G. De Feriet, Groljean & Beneteau, C. Brigs (President L. M. Ins. Co.), L. Lesassier, Geo. Clark, Bloomfield, Steel & Co., G. W. Hynson, Legay & Lecanu, Giffen, Smedes & Co., J. L. Fabre (Sec. Mayoralty), Gustave Durel, Francis Mouney, E. M. Delery, Vincent & Co., Blache & Leaumont, Sampson & Keen, Hugh Kennedy, Alfred Phillips, Sewell T. Taylor, N. Whitney, Robert Pitkin, John T. Lawkin (Miss.), J. W. Dougherty, Alexander Levy, G. E. Freret (Cashier U. Bank), J. B. Cotton.

New Orleans, 1859. 1*

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No. 433 Broome st., first door from Broadway, New York.
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PATENT COMPOSITION BELTS—PATENT PACKING—The Company have on hand and are ready to supply all orders for their superior Composition Machine Belting. They are proof against cold, heat, oil, water, gases, or friction, and are superior to leather in durability, and much cheaper in cost. The composition gives to these belts uniform durability and great strength, causing them to hug the pulley so perfectly that they do more work than any other belts of the same inches. The severest tests and constant use in all sorts of places during the last 14 months has proved their superiority, and enables the Company to fully guarantee every belt purchased from them. Manufacturers and mechanics are invited to call, examine, and test these belts. The Patent Packing for planed joints is in every way superior to any other article ever used for that purpose. A liberal discount allowed to the trade. "New York and Northampton Belting and Hose Co.," E. A. STERN, Treasurer, 217 Fulton st., New York. 16 tf

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A MESSIEURS LES INVENTEURS—Avis Important.—Les inventeurs non familiers avec la langue Anglaise, et qui prefereraient nous communiquer leurs inventions en Francais, peuvent nous addresser dans leur langue natale. Envoyez nous un dessin et une description concise pour notre examen. Toutes communications seront recues en confidence.

MUNN & CO. Scientific American Office, 37 Park Row, New York.

Zur Beachtung für Erfinder.

Erfinder, welche nicht mit der englischen Sprache bekannt sind, können ihre Mittheilungen in der deutschen Sprache machen. Skizzen von Erfindungen mit kurzen, deutlich geschriebenen Beschreibungen beliebe man zu adressiren an

Munn & Co.,
37 Park Row, New-York.

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Science and Art.

Suspension Lumber Bridge.

MESSRS. EDITORS—Knowing that the SCIENTIFIC AMERICAN has a large circulation among lumbermen, I will give you a description of a new and original suspension lumber bridge, lately erected by Messrs. Lowe & Dubois, of this place, which, I believe, will be of interest to all persons engaged not only in the same, but other branches of business.

In order to ship the lumber manufactured at their mill—which is capable of cutting ten million feet every season—they had to put it into scows, pole it across the river, 1,200 feet wide, carry it up a bank 15 feet high and then pile it. This boat-work was very slow and expensive ; and besides, a freshet in the river, a high wind or flow of ice, suspended operations entirely. John Dubois, one of the firm, tired of this imperfect manner of working, concluded to try a suspension bridge for the conveyance of the lumber across the river by means of the motive power at the mill. The announcement of his plan was laughed at by many persons, and expressions such as "a fool and his money are soon parted," &c., were applied to him. He, however, was not discouraged by opposition, but resolutely carried out his design amid many jeers, and it is now in successful operation.

The distance from the mill to the Pennsylvania Canal on the opposite side of the river is 1200 feet, but 320 are taken up by the abutments of the bridge, and by that part of it which spans the tow-path of the canal. The remaining part of 880 feet is crossed by a wire suspension bridge of four spans, each 220 feet; the hight above the water is 30 feet; the supports are two of Roebling's wire cables, one about 1¼ inches in diameter, the other about one inch in diameter. From these cables, 52 cross timbers are suspended in each span by wires three-sixteenths of an inch in diameter. A lumber way, 27 inches wide, is laid on the cross timbers, this is bounded by boards set on edge at each side, and on its bottom is a series of hard-wood rollers which have iron spindles accurately turned, and moving very freely. At the mill end of the bridge there are placed two pressure rollers between which a board is first passed, then a second which pushes the first before it, and on these the workmen pile the timber from four to six boards deep, and thus continue so to do, as each successive load leaves the pressure rollers, until the whole road-way 1,200 feet long is filled with a string of moving boards and planks from the mill to the canal boat, to which they are propelled in unbroken succession, by the mill engines. The speed of the machinery has to be restrained, as it is capable of delivering more timber than the boatmen can stow away. Mr. Dubois calculates that only two horse power is required to drive the pressure rollers.

The cables of the bridge are situated ten feet apart, and afford an ample foot path by the side of the lumber-way. The lumber is piled and dried near the mill, and can be taken down and passed across the bridge at a less cost than merely taking it down from piles and handling it across the tow-path to the boats as was done formerly. By this bridge an immense saving is effected over the former method of transporting the lumber across the river as described ; and besides, the lumber sells for a higher price in the market, as much of it used to be injured in the loading of the scows, by the water, and by handling. No less than 10,000 feet of boards have passed in one hour across this bridge, and on the whole, it is an improvement which may be useful for others to know about, so as to apply it in like circumstances and obtain benefits equally as favorable as those Messrs. Lowe & Dubois have reaped. Its cost was $2,000, a sum which it will save in one season for the proprietors. The complete success of this lumber bridge in effecting the objects contemplated by its projector renders it the admiration of all who witness its operations.

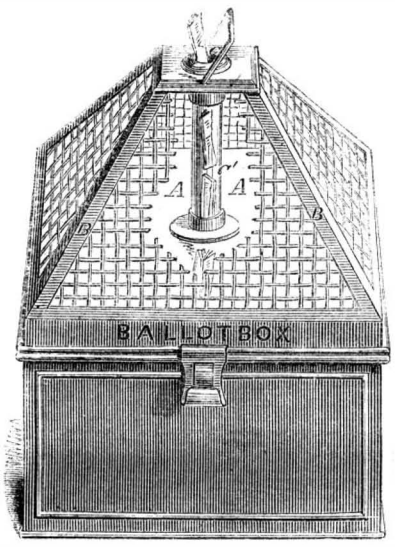
S.

Williamsport, Pa., Jan., 1859.

Cumming's Ballot Box.

Vote by ballot is a splendid institution, allowing freedom of election and perfect representation ; it is, without doubt, the surest way to ascertain the honest conviction of any body of people. In our country districts it does this; but in cities, where office-seekers are more numerous, and public morals at a much lower standard, even the ballot box has not escaped corruption ; and that institution which was established for the promotion of honest and perfect representation has been degraded by small politicians and designing citizens into a cloak for their dishonesty and a cover for their peccadilloes.

But we are not writing on political economy, or on the management of elections in these United States, our simple purpose at the present being to describe a new ballot box, invented by Allan Cummings, of 420 Fourth avenue, New York, which is intended to render deception in the depositing of the ticket an impossibility, and also place a safeguard upon the tickets, by keeping them always in sight.



The box is of tin plate, or other sheet metal, covered with a glass plate, A ; on this is a pyramidal protection of wire gauze, B, which prevents any breaking of the box by malicious persons; and a glass tube, C′, passes from the opening, C, into the box, through a hole in the glass plate, A. By this arrangement, the ballots that are inserted one by one at C, are visible in single file for some time—the insertion of each one displacing another at the lower end of the tube; it being understood that they do not (owing to the spring of the paper and its friction in the tube) drop directly through the tube, but after the ballots have descended into the body of the box, its entire contents are constantly visible while the polling lasts, and before it commences.

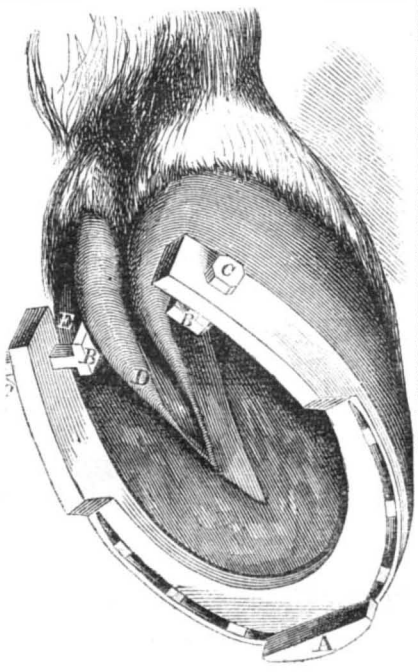
This simple invention, which we recommend to the notice of the governments of all large cities, was patented May 18, 1858. This inventor will be happy to furnish any further information upon being addressed as above.

Thompson's new Railroad Car.

A few weeks ago a patent was issued to Nathan Thompson, Jr., of this city, for a railroad car entirely different in its nature and construction from any that has heretofore been brought before the public. A full-sized model has been publicly exhibited by him for the past three weeks, and we have taken some pains to give it a careful examination. It is designed for both a night and day car—sitting, waking, walking, lounging, and sleeping. Viewed for use during the day, each seat appears like that of a comfortable sofa for four persons. In two minutes it can be transformed to allow one person to sleep in an upper berth, like that of a steamboat, while the other three have the same freedom as before, either to sit or recline. In about the same space of time as it took to make the first change, all the passengers can arrange the appliances and occupy as many several berths; and this can be done with perfect liberty to each, so as to permit every passenger to sit, or go to rest when he chooses. Each sofa seat may be considered a separate apartment, as it is arranged with sliding partitions, to screen the occupants from public gaze.

By the use of such railroad cars, families and parties may have their separate apartments for rest during night, or quiet intercourse during the day; and if there were a line of railroad to the Pacific, an army might be transported perfectly fresh in a few days, by one continual trip, from New York to California. It is the most compact and convenient day and night car which has been exhibited in this city. One is about to be furnished to the Emperor of Russia for military purposes on the great Moscow railroad.

Hubbard's Hoof-expanding Horseshoe.



The wild horse is measurably free from disease, whilst many of the most serious and complicated diseases to which the horse is liable is the result of his domestication, and no class more purely so than those that effect the feet. The manner in which they are used, and the care or, more properly, the want of care taken of them, invariably produces a feverish state of the system, which uniformly exhibits itself, in part, by contraction and brittleness of the hoof. When once this contraction begins to take place, the horse becomes a cripple until relieved. The hoof, the bars, the sole, and the horny frog, constitute the outer structure of the horse's foot, and in a great degree are insusceptible to feeling. On the internal portion of these parts is found a most delicate and beautiful set of lamina, resembling those found on the underside of a mushroom, numbering, as is estimated, about five hundred, which articulate with a similar number given off from the coffin bone. Each lamina, having two sides and an edge, forms a series of articulations, numbering about three thousand. From this, some idea may be formed of the delicate structure of the horse's foot, and the serious consequences that result from a contraction of the hoof, whether produced by defective shoeing or a feverish and diseased condition of the system.

Numerous plans have been devised with a view of remedying the serious results of contracted hoof, but few of which accomplish the desired object like the improved method exhibited in our illustration.

A represents the shoe. It is made heavy, and somewhat wider than the hoof to which it is to be attached, and is also made sufficiently stiff and unyielding as not to materially spring or bend inwardly when the nuts are turned, in order to spread or expand the hoof.

B is the hook. This has a shank of sufficient length to pass through the thick heel part of the shoe, and receive the nut on the end, and with sufficient strength of screw to admit of the necessary expansion of the hoof. The hook catches over or hooks on the crust or hind part of the hoof. It does not touch the soft or sensitive part of the foot. The shoe is nailed to the hoof near the toe, leaving the heel free to be drawn outwardly, or expanded by the hoof and screw. C is a screw nut on the shank end of the hoof. E is the crust, or hard part of the hoof. D is the frog of the foot.

The nuts may be turned a little every day, and the hoof gradually expanded as the circumstances of the case may require, and until the cure is effected. This shoe may be worn with ease and perfect freedom to the horse's foot; and in practice will be found to act efficiently as a preventive against, and as a cure for, inflammation, fever, and contraction of the horse's foot.

It was patented June 29, 1858, by William C. Hubbard, of Randolph, N. Y., who will furnish any other information that may be desired, upon being addressed as above.

Sarsaparilla.

Dr. Bocker, of Bonn, on the Rhine, so well known for his experiments on the digestion of articles of food and aliment, has by experiment discovered that sarsaparilla has none of those wondrous purifying properties usually attributed to it, and that it is a useless and expensive hospital drug. This but confirms the opinion which has been previously expressed through our columns.

MECHANICS

INVENTORS, MILLWRIGHTS. FARMERS AND MANUFACTURERS.

FOURTEENTH YEAR

PROSPECTUS OF THE

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